GPI Atlantic

for Atlantic Canada / Indice de progrès véritable - Atlantique

MEASURING SUSTAINABLE DEVELOPMENT

APPLICATION OF THE GENUINE PROGRESS INDEX TO NOVA SCOTIA

# THE ECONOMIC IMPACT OF SMOKE-FREE WORKPLACES:

## AN ASSESSMENT FOR NOVA SCOTIA

*Prepared by:*
Ronald Colman, Ph.D, **GPI***Atlantic*
With research assistance from Catherine M. Urbonas
*for*
Tobacco Control Unit, Nova Scotia Department of Health
September 2001

# EXECUTIVE SUMMARY

**Exposure to Second-Hand Smoke is a Serious Health Risk**

- There is a consensus among the most reputable scientific and medical academies and government agencies on the serious health hazards of second-hand smoke or environmental tobacco smoke (ETS).

  Exposure to second-hand smoke causes heart disease, lung cancer, nasal sinus cancer and respiratory ailments in adults, and it causes sudden infant death syndrome, fetal growth impairment and a wide range of respiratory conditions in infants and children, including bronchitis, pneumonia, middle ear disease and asthma exacerbation. ETS exposure causes about 200 deaths per year in Nova Scotia and is the leading cause of workplace death. More recent research has linked ETS exposure to cervical and breast cancer, stroke, and miscarriages in adults; and to asthma induction, decreased lung function, cystic fibrosis, and cognition and behaviour problems in children.

- Restaurant, bar and casino workers are particularly at risk from workplace exposure to second-hand smoke. In restaurants, second-hand smoke levels are twice as high as in other workplaces that do not have smoking restrictions. In bars and casinos they are 3-6 times as high. Food service workers have a 50% higher rate of lung cancer than the general population.

  Excess mortality for workers in smoking lounges, bars, restaurants, casinos and bowling alleys is 15-26 times higher than OSHA's "significant risk" level.

- Smoke-free workplace legislation would reduce ETS exposure among Nova Scotians by 80%, cut cigarette consumption among smokers by 20%, and save Nova Scotia an estimated $200 million a year in avoided health care costs ($50 million) and productivity losses ($150 million).

**Ventilation Does Not Remove Toxins or Prevent ETS Exposure**

- Expert assessments, empirical evidence, risk assessment procedures, and internationally accepted indoor air quality and ventilation standards have determined that ventilation and non-smoking sections do **not** remove the toxic constituents of tobacco smoke from the air and provide no solution to the problem of exposure to second-hand smoke.

  Instead, the recommendations of expert scientific panels on ETS exposure are "*clear, consistent and unanimous – **all involuntary exposure is harmful and should be eliminated.***"[2] The U.S. Surgeon-General has called for "*100% smoke-free environments in all public areas and workplaces, including all restaurants and bars.*"[2]

**Smoke-free Policy Has No Adverse Impact on Business and May be Good for Business**

- Without exception, every objective study using official sales tax data demonstrates that smoke-free legislation has no adverse impact on restaurant, bar, hotel and tourism receipts. Two studies find an initial decline in receipts in the first 1-2 months following enactment, but no evidence of any overall or aggregate decline in the longer term. Indeed, several studies find that restaurant, bar, hotel and tourism receipts increase following smoke-free legislation, indicating that it may be good for business as non-smokers frequent eating and drinking establishments more often and smokers adjust to the new rules.

- Given the consistency of the evidence, the enormous and costly toll of second-hand smoke exposure, the economic benefits of smoke-free workplace legislation, and the demonstrated lack of any adverse impact on business, there is a clear case for such legislation in Nova Scotia. This is particularly true in light of the growing body of legal precedent indicating that governments and employers are bound by law to ensure safe working environments for employees and to remove known health hazards from the workplace.

**Tobacco Industry Arguments Have Been Proven False**

- Past obstacles to smoke-free workplace legislation can only be understood by reference to tobacco industry resistance and opposition. Tobacco industry documents reveal extensive industry efforts to prevent public smoking restrictions by denying the overwhelming evidence on the health hazards of second-hand smoke and working through and funding arms-length third parties to lobby against smoke-free legislation.

- Industry claims of declining revenues after implementation of smoking bans, when checked against objective sales tax receipts, have always been proven false.

- Active involvement by the health community has been shown to be the most determining element in ensuring the successful passage of smoke-free legislation in other jurisdictions.

# TABLE OF CONTENTS

**Part 1: Introduction** ..... 7
1. Introduction ..... 8
1.1 Full Benefit-Cost Analysis ..... 8
1.2 The Precautionary Principle ..... 10
1.3 The Tobacco Industry Case on "Scientific Certainty" ..... 12
1.4 Conclusion ..... 14

**Part II: Health Costs of Passive Smoking** ..... 17
2. Diseases Related to Second-Hand Smoke ..... 18
2.1 ETS and Lung Cancer ..... 20
2.2 ETS and Other Cancers ..... 21
2.3 ETS and Heart Disease ..... 23
2.4 ETS and Respiratory Illness ..... 26
2.5 Do Designated "Non-Smoking" Areas Provide Protection from ETS? ..... 28
2.6 Do Ventilation and "Courtesy of Choice" Provide Protection from ETS? ..... 30
3. Economic Costs of Passive Smoking ..... 34
3.1 Additional Savings due to Reduced Smoking Rates ..... 36
3.2 Additional Economic Savings ..... 38
3.3 Litigation Costs and Legal Requirements ..... 39
3.4 Conclusion ..... 41

**Part III: Impact of Workplace Smoking Bans on Restaurant, Bar and Hotel Sales** 43
4. Impacts of Workplace Smoke Bans on Business: Methods ..... 44
5. Impacts of Workplace Smoke Bans on Sales: Results ..... 47
5.1 San Luis Obispo Restaurants and Bars, California, 1993 ..... 48
5.2 Restaurants and Bars, California and Colorado, 1992, 1994, and 1997 ..... 49
5.3 Restaurants, California, 1994 ..... 51
5.4 Restaurants, West Lake Hills, Texas, 1995 ..... 52
5.5 Restaurants and Bars, Massachusetts, 1997 and 2000 ..... 53
5.5.1 Massachusetts: Refinements in the 2000 Study Update ..... 54
5.6. Restaurants, Hotels and Motels, Arizona, 1998 ..... 56
5.7 Restaurants and Hotels, New York City, 1999 ..... 57
5.8 Tourism and Hotel Revenues in 6 U.S. States, 1999 ..... 59
5.9 Conclusions of All Studies ..... 60
5.10 Predicted Impacts on Nova Scotia Tourism Flows ..... 62
6. Other Economic Impact Studies ..... 63
6.1 Short Term Sales: Mesa, Arizona, (1996) and British Columbia (2001) ..... 63
6.2 Patron Surveys and Consumer Behaviour ..... 66

6.2.1 A Note on Existing Owner/Manager Surveys ..... 66
6.2.1: The National Restaurant Association Survey ..... 68
6.2.2 Cornell Survey of New York City Patrons ..... 68
6.2.3 Buffalo Cancer Institute Survey of NYC Consumer Response ..... 70
6.2.4 Massachusetts Surveys of Restaurant and Bar Patrons ..... 71
6.2.5 Restaurateur Concerns versus Actual Experiences 1: Arizona ..... 73
6.2.6 Restaurateur Concerns versus Experiences 2: Quebec ..... 73
6.2.6 Other Studies ..... 75

**Part IV: The Politics of Smoke-Free Legislation** ..... 79
7. Review of the Evidence ..... 80
8. Tobacco Industry Strategies...in the Industry's Own Words ..... 81
8.1 Smoke Bans Threaten Industry Profits ..... 82
8.2 Strategies to Oppose Smoke Bans ..... 83
8.3 Creating "Marketable Science" ..... 84
8.4 Lobbying through Third Parties ..... 85
8.5 Has the Tobacco Industry Changed? ..... 87
9. Assessing Tobacco Industry Claims ..... 89
9.1 The IARC Study ..... 90
9.2 Industry Use of Scientific and Medical Journals ..... 93
10. What Enables Smoke-Free Legislation to Succeed? ..... 94

**Endnotes** ..... 96

**Selected Bibliography** ..... 113

# LIST OF TABLES AND FIGURES

Table 1: Estimated Costs of Passive Smoking, NS, 1999, and Estimated Future Annual Savings of Workplace Smoking Ban (1999$ millions) ..... 35

Figure 1: Restaurant and Take-Out Receipts, Nova Scotia, (1996$ millions) ..... 46

# PART I
# INTRODUCTION

# 1. Introduction

> *"My government is committed to reducing Nova Scotia's excessively high rate of smoking, as well as the huge costs it imposes on our health care system. As part of our initiatives to encourage healthy living, we will introduce a* Comprehensive Tobacco Control Strategy, *aimed at reducing consumption, limiting exposure to second-hand smoke, and creating awareness of the deadly and costly effects of smoking."*
>
> Speech from the Throne, Nova Scotia, March 22, 2001

According to the latest (2000) Statistics Canada survey, 30% of Nova Scotians smoke tobacco, the highest rate of any province in the country. This includes 37% of 20-24 year olds and 38% of 25-44 year-olds.[3] As well, earlier surveys have reported that nearly one-quarter of Nova Scotians (32% of men and 17% of women) are exposed to second-hand smoke at work, and 42% of Nova Scotia children under 12 are regularly exposed to second-hand smoke in the home.[4]

Only Nova Scotia and Prince Edward Island currently have no provincial laws restricting smoking.[5] As part of its proposed *Comprehensive Tobacco Control Strategy,* the Nova Scotia government therefore plans to introduce measures to restrict smoking in workplaces in fall, 2001. This study attempts to evaluate the potential economic impact of that legislation in light of existing experience in North America, as revealed in the scientific and economic literature on the subject.

This report uses the terms "environmental tobacco smoke (ETS)," "second-hand smoke," and "passive smoking" interchangeably to describe the effect of side-stream tobacco smoke on non-smokers.

This assessment rests on two fundamental premises, which must be made explicit in this introduction in order to overcome two equally fundamental misconceptions. The first misconception is that economic impacts can be assessed by sales data analyses alone. The second misconception is that policy action must await "scientific certainty".

The antidotes to these two fallacies are fundamental principles of the Nova Scotia Genuine Progress Index – full benefit-cost accounting in the economic sphere; and application of the "precautionary principle" in the scientific sphere. These two principles provide the basic premises and framework for this study, and should therefore be made explicit in this introduction.

## 1.1 Full Benefit-Cost Analysis

Conventional analyses of the economic impact of smoke-free workplaces generally examine sales revenues of restaurants, bars, hotels and other businesses before and after the implementation of ordinances restricting or banning smoking. The relevant literature on this subject will be examined in Part Two of this study.

However, such analyses taken alone provide only a partial, and potentially misleading, assessment of economic impacts, because they account only for one particular set of immediate benefits and costs borne directly by the business itself. They take no account of indirect and long-term economic benefits or costs borne by society, taxpayers, patrons and employees, such as changes in health status and costs.

Even for the business itself, a full range of economic impacts is rarely considered, including changes in employee productivity and absenteeism, maintenance and cleaning costs, fire insurance premiums, and potential litigation. Changes in the business customer base and the cost of alternative marketing strategies are also seldom included in the analysis.

At neither the business nor societal levels are full benefit-cost analyses of the impact of smoke-free places undertaken. For that reason, it is not surprising that empirical evidence has found business fears of negative impacts, based on assumptions about sales revenues alone, to have almost no relationship to actual outcomes (see Part Two below). In the end, profitability and cost-effectiveness are determined by a much wider range of factors than are generally considered.

A rare exception to the narrow focus of most studies is a 1996 Conference Board of Canada, study, *The Economics of Smoke-Free Restaurants,* which considered impacts on productivity, health costs, absenteeism, operating and safety costs, insurance premiums, legal liability, sales, customer and employee satisfaction, tax revenues, and quality of life. That study concluded:

> *"The case studies and the validation survey do not support the fear that going smoke-free would be detrimental overall for business....(Business concerns) do not appear to be borne out within the existing literature quantifying the costs of benefits of going smoke-free. Reputable studies in the United States suggest that the feared negative impact on restaurant sales due to a smoking ban did not materialize and that the harmful effect of ETS (environmental tobacco smoke) is significant. This conclusion is supported by the information gleaned from the restaurants examined in this study."* [6]

A full benefit-cost analysis of the economic impact of smoke-free workplaces would go beyond business impacts to internalize social benefits and costs, such as potential savings to the health care system from reduced rates of illness due to ETS. This study does not attempt such a full cost-benefit analysis. However, in keeping with all GPI studies, it does accept that basic "full-cost accounting" framework, and therefore begins with a broader analysis of the health impacts of ETS and of a potential smoking ban in workplaces.

Analysis of the impacts of smoking bans on restaurant, bar and hotel sales is only meaningful within that broader framework. The fundamental purpose of workplace smoking bans is, after all, to protect the health of employees and patrons. Setting aside that rationale in an exclusive focus on short-term business sales distorts not only the purpose of the proposed legislation itself, but also the broader economic outcomes themselves.

This understanding is critical from a policy perspective. Even if there were a negative impact on sales, a full benefit-cost analysis would justify the legislation provided that total benefits (including health care savings) outweighed total costs. Indeed, a case could be made that the difference between benefits and costs could then be used to compensate businesses for any losses, without any net loss to taxpayers.

Above all, the broader framework makes clear that the proposed legislation does not rest or fall on sales revenue data alone. It would be a serious distortion of basic economic principles and of full cost accounting mechanisms in particular to base policy on one partial impact (sales) to the exclusion of wider health, productivity, taxation, legal, and quality of life considerations, all of which have major economic impacts.

One analyst has further warned of the dangers of focussing exclusively on the economics of tobacco control, arguing that this allows the tobacco industry to deflect attention from the deadly health impacts of smoking and to shift the issue from the domain of public health to that of fiscal policy. Dr. Kenneth Warner of the University of Michigan maintains that any discussion of tobacco economics must always aim to *"force the issue of tobacco back where it properly belongs, in the domain of public health."*[7]

For these reasons, Part One of this study focuses on the broader health impacts of environmental tobacco smoke, which provide the basic rationale for the proposed legislation. Within that framework, Part Two then assesses the potential impact of the legislation on restaurant, bar and hotel sales in Nova Scotia.

## 1.2 The Precautionary Principle

It has now been explicitly recognized in international agreements, and in national and provincial legislation (including Nova Scotia's Environment Act), that lack of scientific certainty should never prevent decisive legislative action when there is strong evidence of potential severe or irreversible damage to human health and the environment. Indeed it is a flagrant and unethical misuse of science to invoke the need for incontrovertible evidence in order to delay action that could save lives.

Instead, the internationally accepted "precautionary principle" puts the burden of proof on those who argue, in the light of strong evidence to the contrary, that serious damage may *not* occur. For example, the Kyoto climate change accord is based on a consensus among the world's leading meteorologists on the International Panel on Climate Change that the weight of scientific evidence points to human-induced greenhouse gas emissions as a primary cause of potentially catastrophic global warming.

This does not mean that such evidence constitutes incontrovertible proof. Indeed, the climate change models on which these predictions are based are acknowledged to be imperfect. But the evidence is sufficiently strong and the danger of sufficient magnitude that a "precautionary" approach necessitates current cuts in greenhouse gas emissions. If the climate change models are proved wrong, then fossil fuels remain available to be burned with abandon.

The same principle applies to the scientific evidence on the health impacts of second-hand smoke and to legislation that can potentially protect citizens from serious and life-threatening illnesses.

Nearly 30 years ago, the U.S. Surgeon-General, Jesse L. Steinfeld, concluded that the very high carcinogenicity of cigarette smoke created a probable risk of lung cancer for nonsmokers.[8] It took 15-20 more years for that evidence to be scientifically validated beyond any reasonable doubt, and for leading scientific and health agencies throughout the world to confirm the causal link between environmental tobacco smoke and lung cancer.

These agencies include:

- The World Health Organization (1986 and 1999),
- The U.S. National Academy of Sciences of the National Research Council (1986),
- The Australian National Health and Medical Research Council (1987),
- The U.K. Department of Health and Social Security (1988),
- The U.S. Environmental Protection Agency (EPA) (1992),
- The U.S. Public Health Service (1986),
- The U.S. National Institute for Occupational Safety and Health (1991),
- The American College of Occupational and Environmental Medicine (1993 and 2000),
- The California Environmental Protection Agency (1997),
- The Australian National Health and Medical Research Council (1997),
- The United Kingdom Scientific Committee on Tobacco and Health (1998)
- The U.S. National Toxicology Program *(Ninth Annual Report on Carcinogens, 2000)*.[9]

These reviews, carried out by panels of respected, independent scientists or by government agencies with review by scientific expert panels, have all been scientifically rigorous and scrupulous in their methodologies and procedures.

For example, the California Environmental Protection Agency's comprehensive five-year study on the health effects of exposure to ETS was peer reviewed by California's Scientific Review Panel, a body created under California law to provide independent peer review of many scientific aspects of the state's toxic air contaminants and air pollution programs. The California EPA also held public workshops, solicited input from all interested parties including the tobacco industry, and made drafts of the report available for public comment and criticisms.[10]

In addition to the 12 official reports listed above, more than 40 scientific studies have now established the causal role of ETS in the induction of lung cancer. What is remarkable is the high degree of consensus that has emerged from all these published studies on the health hazards of second-hand smoke.[11] It is necessary to emphasize here both the scientific rigour of those studies and their broad agreement on the health effects of ETS because of the tobacco industry's consistent denials and because its strategy of choice has been to find fault with some aspect of each study's methodology.

## 1.3 The Tobacco Industry Case on "Scientific Certainty"

It has taken even longer for the evidence linking second-hand smoke and lung cancer to be translated into action designed to protect employees in particular and citizens in general from a known carcinogen. During this entire 30-year period, the tobacco industry has argued that the evidence was not conclusive and that workplace smoking bans were not justified in the absence of scientific certainty on the health impacts of second-hand smoke.

That campaign of delay has been largely successful, and 24% of Nova Scotian adults today remain exposed to second-hand smoke on a daily basis in their places of work.[12] Assessing the consequences of such delays, Dr. David Burns, Division of Pulmonary Care and Critical Care Medicine at the University of California at San Diego Medical Center, notes:

> *"The scientific case against environmental tobacco smoke is now overwhelming. It is sobering to count the number of lung cancer deaths that might have been avoided had appropriate action been taken following Dr. Steinfeld's public health warning a generation ago. Several tens of thousands of lung cancers and other illnesses might have been avoided if the risk of low-dose exposure to tobacco smoke had been assessed by using the same methods applied for low-dose exposures to other agents established as carcinogens at higher doses."*[13]

That statement graphically illustrates the case for application of the precautionary principle to preventable health risks. Taking decisive action in response to strong (but not incontrovertible) evidence in order to prevent possible death and illness does not deny the need for more and better studies.

The tobacco industry and its spokespersons consistently criticize the design and methodology of the available scientific studies to conclude that links between second-hand smoke and disease cannot be definitively proved. The following is typical:

> *"Detailed examination of the epidemiological evidence, much of which comes from small and/or poorly conducted studies, suggests that major biases result from misclassification of current and past smoking status, from failure to adjust for confounding variables, and, in a number of case-control studies, from a lack of comparability of cases and controls in the circumstances in which the data were collected. Publication bias and other study weaknesses may all have contributed to the observed association (between ETS and lung cancer)....*
>
> *Overall, the epidemiological data do not provide convincing evidence that the reported association results from ETS exposure.*

Taken as a whole, the evidence reviewed does not demonstrate that exposure to environmental tobacco smoke increases risk of cancer, heart disease or other diseases among adult non-smokers....There is no convincing epidemiological evidence that exposure to ETS results in an increased risk of death from cancer, heart disease or any other disease in non-smokers."[14]

Methodological critiques can be welcomed, and every effort should be made to improve research designs, methodologies and sample sizes in further scientific studies. However, when careful and considered assessments by top medical scientists, researchers and national scientific agencies indicate a clear and present danger, the precautionary principle holds that it is an irresponsible misuse of the notion of "scientific certainty" to place lives at risk and to delay action that can protect the health of employees and patrons.

If further studies prove definitively that ETS has no harmful health effect, then smoking bans can always be removed at a later date without lives having been imperiled in the interim. It is noteworthy that tobacco industry critiques never make that claim, but make their case on the basis that current evidence does not definitively prove the causal link.

It is equally noteworthy that a review in the *Journal of the American Medical Association (JAMA)* of 106 articles on the health effects of passive smoking found that three-quarters of articles concluding that passive smoking is not harmful were written by authors with tobacco industry affiliations and funding. When multiple logistic regression analyses controlled for article quality, peer review status, article topic, and year of publication, the *JAMA* review found that *"the only factor associated with concluding that passive smoking is not harmful was whether an author was affiliated with the tobacco industry."* [15]

Most recently, the tobacco industry used the lack of "statistical validity" in a European study by the International Agency for Research on Cancer to lobby intensively against smoking bans in restaurants and bars. Dr. Chris Proctor, head of science for British American Tobacco argued:

> *"If this study cannot find any statistically valid risk you have to ask if there can be any risk at all....It confirms what we and many other scientists have long believed, that while smoking in public may be annoying to some non-smokers, the science does not show that being around a smoker is a lung-cancer risk."* [16]

Interestingly, the IARC study to which Dr. Proctor refers, demonstrated a 17% increased risk of lung cancer due to workplace exposure to ETS. Because of its limited sample size, however, the 95% confidence interval for the study was 0.94-1.45, indicating that lung cancer risk in non-smokers could range from 94% of the risk for non-exposed workers to 145% of the risk.[17] If the odds ratio range encompasses values less than 1.0, then statistical validity cannot be officially claimed, even though it is equally likely that the actual risk is *greater* than the average 17% increased risk found in the IARC study.

Nevertheless the tobacco industry's misuse of the scientific evidence was successful, and newspaper headlines announced that "Passive Smoking Doesn't Cause Cancer."[18] Immediately following these reports, the World Health Organization, which sponsored the IARC study, issued a press release stating: "Passive Smoking Does Cause Lung Cancer, Do Not Let Them Fool You:"

> *"The results of this study, which have been completely misrepresented in recent news reports, are very much in line with the results of similar studies both in Europe and elsewhere:* ***passive smoking causes lung cancer in non-smokers....***

*'It is extremely important to note that the results of this study are consistent with the results of major scientific reviews of this question published during 1997 by the government of Australia, the US Environmental Protection Agency and the State of California....A major meta-analysis of passive smoking and lung cancer was also published in the British Medical Journal in 1997. From these and previous reviews of the scientific evidence emerges a clear global scientific consensus – passive smoking does cause lung cancer and other diseases.' "*[19]

## 1.4 Conclusion

The preceding discussion focuses on the links between lung cancer and ETS to illustrate the precautionary principle adopted as a fundamental premise in this report and the contrary case for delaying action until the establishment of scientific certainty that is advanced by the tobacco industry. However, that debate is even more marked in relation to the links between ETS and other illnesses.

Lung cancer was the first disease definitively linked to active smoking, and it has now become the first disease identified as caused by passive smoking. The relationship between lung cancer and smoking has been relatively easier and quicker to identify and study than other diseases because smoking is the primary cause of lung cancer, which was a rare disease before the advent of mass-marketed cigarettes.[20]

Because heart disease has many risk factors, it took the scientific community longer to conclude that active smoking caused heart disease, and it has taken longer again to establish the links between passive smoking and heart disease. Similarly research on the links between passive smoking and respiratory illnesses has also lagged that on lung cancer. We are now in an analogous situation with respect to our understanding of these associations as we were in the late 1980s on the ETS-lung cancer links.

The present moment therefore represents a unique opportunity to apply the precautionary principle in relation to the multiple health risks of ETS uncovered to date, and to learn from the heavy costs of previously delaying action on the links between ETS and lung cancer until scientific certainty could be established.

It has already been estimated that heart disease deaths due to passive smoking are ten times greater than lung cancer deaths due to passive smoking. Do we act now, on the basis of strong and rapidly accumulating evidence, to protect the lives and health of Nova Scotians? Or do we put those lives at risk, as the tobacco industry counsels, until scientific certainty can be definitively and incontrovertibly established?

Because this is a vital *policy* question, this report begins in Part One, with a brief review of the scientific evidence on the health effects of passive smoking. From a full-cost accounting perspective, that is also the essential framework for any assessment of the economic impacts of workplace smoking bans. As noted above, a full economic benefit-cost analysis must include potential taxpayer savings in reduced health care costs.

*Within* that framework, and against the background of the fundamental health objectives of the proposed workplace legislation, the likely impact of a smoking ban on restaurant, bar and hotel revenues can then be assessed in Part Two.

# PART II
# HEALTH COSTS OF PASSIVE SMOKING

## 2. Diseases Related to Second-Hand Smoke

Second-hand smoke contains over 4,000 different chemicals, of which 1,200 are known to be harmful to humans, including more than 50 known carcinogens and 103 chemicals identified as poisonous to humans. The chemical compounds in tobacco smoke include toxic heavy metals, pesticides, and dangerous chemicals like carbon monoxide, vinyl chloride, formaldehyde, hydrogen cyanide, radionuclides, benzene and arsenic.[21]

The U.S. Environmental Protection Agency has classified environmental tobacco smoke as a "Group A carcinogen," a classification reserved only for those compounds shown to cause cancer in humans based on studies of human populations.[22] ETS causes more mortality than all other known environmental toxins combined,[23] and increases the risk of death from heart disease by 20%-30% for non-smokers married to smokers.[24]

Six major scientific reviews by national scientific and government agencies in the 1990s identified fifteen diseases or conditions as known or suspected to be caused by exposure to second-hand smoke. These include four developmental diseases or conditions, seven respiratory diseases or conditions, three cancers, and coronary heart disease. Recent research has also implicated ETS as a possible cause of breast cancer and stroke.[25]

Passive smoking kills an estimated 200 Nova Scotians every year, 70% from heart disease, 7% from lung cancer, and the remaining 23% from other cancers.[26] It causes more than 1,000 respiratory tract infections such as pneumonia and bronchitis in Nova Scotia infants, a worsening of the asthmatic conditions of up to 4,000 more children and up to 100 new cases of childhood asthma a year in the province. Secondhand smoke is a major cause of preventable death in Nova Scotia along with active smoking (1,600 deaths a year in Nova Scotia), obesity (1,000), alcohol (220), physical inactivity and poor diet (mortality estimates not yet derived for NS).[27] Second-hand smoke is the leading cause of workplace death.[28]

In the 1995 Nova Scotia Health Survey, nearly one-quarter of Nova Scotians (28% of women and 17% of men), and 27% of non-smokers, reported that ETS created health problems for them. An additional 16% said they experienced irritation from exposure to second-hand smoke. Breathing difficulties (51%) were the most commonly reported health problems from ETS, followed by eye irritation (32%), headaches (15%), and nausea (4%). Fully 24% of Nova Scotians (32% of men and 17% of women), reported being exposed to ETS at work, and 34% of non-smokers reported exposure to ETS outside the home.[29] Although this study focuses on workplace smoking restrictions, it must be noted that 42% of children under 12 in Nova Scotia are regularly exposed to environmental tobacco smoke in the home.

Those most at risk of illness and death due to passive smoking are:

a) Infants and children of smokers, who incur significant risks of respiratory infections, ear problems, asthma, and sudden infant death syndrome. For example, second-hand smoke increases the risk of chronic middle-ear infection in children of smokers by 3.5 times, and the risk of asthma and asthma wheeze by more than 50%.[30]
b) Spouses of smokers who have a higher risk of lung cancer and heart disease.[31]

c) Employees exposed to second-hand smoke in the workplace.[32]

Restaurant, bar and casino workers are exposed to the highest levels of environmental tobacco smoke of any occupational or demographic group, and they have less protection from second-hand smoke than any other group of employees.

Cotinine, the major metabolite of nicotine, is the most common biologic marker of ETS exposure.[33] Casino workers in a well-ventilated Atlantic City casino were found, at the end of their shifts, to have a geometric mean serum and urine cotinine level attributable to ETS exposure of 1.85 ng/mL. This is between *three* and *six* times higher than other workers exposed to ETS at work (0.32 - 0.65 ng/mL.).[34]

Levels of environmental tobacco smoke in restaurants are about 1.6-2.0 times higher than in office workplaces that do not have total smoking bans, and 1.5 times higher than in residences with at least one smoker. ETS levels in bars are 3.9-6.1 times higher than in offices and 4.5 times higher than in residences with a smoker. [35]

Summarizing that evidence, which is based on ambient air survey data on ETS levels in more than 1,000 offices, more than 400 restaurants, and more than 600 homes, Dr. Michael Siegel of the University of California concludes:

> *"Environmental tobacco smoke is a significant occupational health hazard for food-service workers. To protect these workers, smoking in bars and restaurants should be prohibited."*[36]

While most regulatory efforts have focused on protecting the public in general, and restaurant and bar patrons in particular, from the effects of environmental tobacco smoke, Siegel points out that restaurants are also workplaces. Restaurant and bar employees spend a much longer time exposed to ETS than do patrons, and their exposure is more likely to result in adverse health effects for them:

> *"Public health efforts to regulate smoking in bars and restaurants can no longer focus only on protecting the patron. Food-service workers must be afforded the same public health protection as other workers."*[37]

For this reason, Health Canada recommends that 100% smoke-free bans in workplaces include *all* workplaces, including the hospitality sector.[38]

Because this report provides background information for proposed workplace legislation in Nova Scotia, the disease-specific review that follows focuses only on those health impacts of environmental tobacco smoke that pertain to the workplace and to working adults. It does not, therefore, review the medical evidence on impacts of ETS on children.

## 2.1 ETS and Lung Cancer

A 1997 *British Medical Journal (BMJ)* review of "the accumulated evidence on lung cancer and environmental tobacco smoke" concluded that non-smokers living with a smoker have an excess lung cancer risk of 24%. Positive and negative adjustments for bias, misclassification, and diet produced an adjusted excess risk of 26%.[39] The 1998 report of the United Kingdom Scientific Committee on Tobacco and Health similarly concluded that ETS exposure is a cause of lung cancer, and that those with long-term exposure have an increased risk of 20-30%.[40]

Epidemiological evidence in both the U.S. and Europe demonstrates that the increase of lung cancer risk from workplace exposure is generally the same as that for household exposure.[41] However, the excess risk of lung cancer is considerably higher for restaurant, bar and casino workers, who are exposed to much higher levels of ETS than other workers.

Six separate epidemiological studies that controlled for active smoking found an average excess lung cancer risk of 50% for food-service workers compared with the general population. This is double the excess risk facing workers in other workplaces that do not prohibit smoking.[42]

Twenty separate studies have now found a dose-response relation between intensity and duration of exposure to ETS on the one hand and lung cancer risk on the other. On average, the risk for a non-smoker increases by 23% for every 10 cigarettes smoked per day by a spouse, and by 88% if the spouse smokes 30 a day. Lung cancer risk increases by an average of 11% for every 10 years of exposure to ETS in the home, and by 35% for 30 years exposure.[43] Up to one-quarter of lung cancer deaths in non-smokers are related to second-hand smoke.[44]

Although the vast majority of studies to date have been on spousal exposure to ETS, this does-response relationship is now being confirmed in the workplace as well. A recent case-control study in German workplaces found a statistically significant dose-related excess lung cancer risk among exposed workers (odds ratio: 1.93; confidence interval 1.04-3.58).[45]

As well, biochemical evidence has now confirmed earlier epidemiological evidence. Four studies have found urinary cotinine concentration in non-smokers living with smokers to be, on average, three times that in non-smokers living with non-smokers. Nicotine from tobacco smoke is the only source of cotinine. Relative to non-smokers with no exposure to environmental tobacco smoke (urinary cotinine zero), non-smokers living with a smoker have a 42% higher risk of lung cancer based on this biochemical marker.[46]

In summary, the most recent studies strongly confirm the conclusions of national and international scientific and medical committees and organizations a decade earlier, that passive smoking is a cause of lung cancer (See section 1.2 above.) Based on all the available evidence, the *BMJ* review concluded:

> ***"The epidemiological and biochemical evidence on exposure to environmental tobacco smoke, with the supporting evidence of tobacco specific carcinogens in the blood and urine of non-smokers exposed to environmental tobacco smoke, provides compelling confirmation that breathing other people's tobacco smoke is***

*a cause of lung cancer.... All the available evidence confirms that exposure to environmental tobacco smoke causes lung cancer....*

*The similarity of the direct estimate of lung cancer due to environmental tobacco smoke and the indirect estimate from extrapolating from the risk in smokers, the evidence of a dose-response relation, the inability of bias or confounding to explain the association, and the presence of tobacco specific carcinogens in the blood and urine of non-smokers lead to an inescapable conclusion that exposure to environmental tobacco smoke is a cause of lung cancer."*[47]

## 2.2 ETS and Other Cancers

In 1992, the United States Environmental Protection Agency concluded that environmental tobacco smoke is a *"Group A human carcinogen, the EPA classification 'used only when there is sufficient evidence from epidemiological studies to support a causal association between exposure to the agents and cancer'."*[48]

The finding was confirmed in the Ninth Report on Carcinogens of the U.S. National Toxicology Program, which in 2000 added ETS to its official list of 41 known human carcinogens, which includes substances such as asbestos, coke oven emissions, radon, and mustard gas:

> *"Environmental tobacco smoke (ETS) is known to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in humans that indicate a causal relationship between passive exposure to tobacco smoke and human lung cancer. Studies also support an association of ETS with cancers of the nasal sinus."*[49]

This classification by the National Toxicology Program is highly significant, because regulatory bodies, including occupational health and safety agencies, often use its classifications for their own regulatory control action. These agencies generally recognize that there is no safe level of exposure to known human carcinogens, and recommend no exposure to known human carcinogens. In short, the classification requires concerted action to eliminate involuntary exposure to tobacco smoke.[50]

Not only has second-hand smoke been classified as a known human carcinogen in its own right, but at least eight other substances on the National Toxicology Program's list of 41 known human carcinogens are also components of tobacco smoke. These include 4-aminobiphenyl, arsenic, benzene, 1,3-butadiene, cadmium, chromium VI, 2-naphthylamine, and vinyl chloride.[51] In addition, the International Agency for Research on Cancer has determined that there is sufficient evidence of carcinogenicity in animals for 43 chemicals in tobacco smoke.[52]

It has been estimated that passive smoking may actually cause more than three times as many deaths due to other cancers than due to lung cancer.[53] But because lung cancer is so specific to cigarette smoking, and because other cancers have a far greater range of potential triggers, research in this area has lagged the ETS-lung cancer studies, and the evidence is more recent. As

noted earlier, this is not surprising, as lung cancer was also the first disease definitively associated with active smoking, with other associations proven more recently.

Because of the multiple causes of other cancers, biochemical evidence has been critical in recent research, and considerable efforts have focused on the emerging role of carcinogen biomarkers and molecular epidemiology. This incorporation of carcinogen biomarkers into epidemiological studies can potentially provide greater specificity in linking exposure and disease than conventional techniques.[54]

Carcinogens in environmental tobacco smoke are inhaled and pass into the blood where they can be metabolically activated. If elevated levels of particular carcinogens are found in the blood and urine samples of non-smokers exposed to ETS, higher risks can therefore be expected for the types of cancer associated with those particular carcinogens.

Elevated blood levels and urinary concentrations of tobacco-specific carcinogens, including DNA and haemoglobin adducts, have in fact been found in non-smokers exposed to ETS for all three major classes of carcinogens in tobacco smoke – polynuclear aromatic hydrocarbons (PAHs), nitrosamines, and aromatic amines.[55]

Certain tobacco-specific PAHs found in ETS, such as benzo[a]pyrene, are well-established respiratory carcinogens, while a haemoglobin adduct like 4-aminobiphenyl (4-ABP), also present in ETS, is a potent bladder carcinogen. Three separate studies have found 4-ABP-hemoglobin adduct levels in non-smokers exposed to ETS to be 14%-20% of the levels in smokers, with levels of 4-ABP adducts increasing significantly with increased ETS exposure.[56]

Interestingly, the 14% figure is roughly proportional to the estimated ratio of mortality rates for passive and active smoking, and the dose-response relationship indicates that restaurant, bar and casino workers are at higher risk for bladder and other cancers than other workers, due to their higher levels of ETS exposure. The authors of one study concluded:

> *"Nonsmokers may receive a nontrivial dose of carcinogens from environmental tobacco smoke proportional to their exposure to environmental tobacco smoke....The relationship between environmental tobacco smoke exposure and 4-ABP-hemoglobin adduct levels supports epidemiological evidence that environmental tobacco smoke is carcinogenic to passive smokers."*[57]

Second-hand smoke has also been linked to other cancers, such as nasal sinus cancer and cervical cancer.[58] However, it must be acknowledged that epidemiological evidence on the relationship between ETS and other cancers is still being gathered and lags the evidence on ETS and lung cancer by about two decades.

Interestingly, as research continues, new studies continue to reinforce the results of the major international scientific agencies described here, and none have called into question the basic findings that ETS causes lung cancer, nasal sinus cancer, heart disease, and other ailments. Instead, the new research points to previously unrecognized effects of exposure to second-hand smoke, including stroke and breast cancer.

A large Canadian study by the Canadian Cancer Registries Epidemiology Research Group (2000) found that both active *and* passive smoking about doubled the risk of breast cancer in pre-menopausal women. Among post-menopausal women, active smoking increased the risk of breast cancer by 50%, and exposure to second-hand smoke increased the risk by 20%. Dose-response relationships were observed for both active smoking and exposure to second-hand smoke. These results are confirmed by nine published studies that have controlled properly for second-hand smoke exposure. Taken together, the results also show almost a doubling of breast cancer risk with *both* long-term active smoking *and* regular exposure to second-hand smoke.[59]

The elevated levels of known tobacco-related carcinogens in the blood and urine of non-smokers exposed to ETS may be classified as "circumstantial" evidence sufficiently strong to trigger the precautionary principle discussed in Part One. Immediate protective action is warranted on the grounds that the mechanisms and pathways between ETS exposure and other cancers are well known and physiologically and biochemically plausible. One study notes:

> *"Long-term exposure to ETS exerts carcinogenic effects by increasing the cumulative risk that a carcinogenic molecule from ETS will damage a cell and then initiate or promote the carcinogenic process."*[60]

That process applies to many cancers other than lung cancer. Further molecular epidemiological studies hold the promise to link the 50 known human and animal carcinogens in ETS to particular cancers with a far greater degree of specificity than is possible today.

## 2.3 ETS and Heart Disease

Just as it took longer to establish the links between active smoking and heart disease than between smoking and lung cancer, so the evidence on ETS and heart disease is also correspondingly more recent. As noted above, this is largely because the many risk factors in heart disease have made it more challenging to identify the causal links with smoking and to control for the wide range of other possible risk factors.

By 1983, the U.S. Surgeon-General was able to establish that cigarette smoking is the largest preventable cause of heart disease in the United States.[61] Once the link was confirmed, smoking was found to kill more people due to heart disease than due to lung cancer.

As recently as 1986, there was insufficient evidence to link heart disease unequivocally with ETS.[62] That situation dramatically shifted in the 1990s with leading researchers definitively concluding that "passive smoking causes heart disease," and that about ten times as many passive smokers die of heart disease as die of lung cancer. A review of ten studies found that both male and female non-smokers exposed to ETS in the home have an overall 30% higher risk of death from heart disease than those married to non-smokers.[63]

These mortality estimates are confirmed in studies on heart disease *incidence* attributable to second-hand smoke. Statistically significant dose-response relationships have been found between increasing amounts of smoking by the spouse and the risk of heart disease in the non-

smoking spouse.[64] Dr. Malcolm Law of the Wolfson Institute of Preventive Medicine in London analyzed 19 published studies involving 6,600 people, and found that people who have never smoked also have a 30% greater chance of developing heart disease if they live with a smoker:

> *"Our result confirms the high risk of heart attack arising from breathing other people's smoke and shows that it is likely to be due to the blood clotting system being very sensitive to small amounts of tobacco smoke."*[65]

Far fewer workplace studies have been conducted, but most studies show similar levels of ETS exposure where no workplace smoking bans are in effect as in the homes of smokers, with significantly higher levels of exposure in restaurants, bars and casinos. Specific workplace studies have now found that workers exposed to second-hand smoke at work experience excess heart disease, with a statistically significant linear trend with measures of increasing exposures.[66]

The American Heart Association has determined that passive smoking is an important risk factor for heart disease, and the U.S. Occupational Safety and Health Administration (OSHA) has included the effects of ETS on the heart in its risk assessments of passive smoking.[67] The California Environmental Protection Agency has concluded that both heart disease mortality, and acute and chronic heart disease morbidity are causally associated with ETS exposure.[68]

Pooling the available statistical evidence from 12 different epidemiological studies, and accounting for confidence levels, researchers have concluded that one can be *"more than 97.5% confident that passive smoking increases the risk of death from heart disease."*[69] Observation of 11 more studies of non-fatal cardiac events, including three demonstrating dose-response relationships, with higher exposures of second-hand smoke associated with larger increases in risk, led the researchers to conclude:

> *"The fact that passive smoking increases the risk of nonfatal coronary events is consistent with what we know about the physiology and biochemistry of how passive smoking affects the heart....In addition, the fact that the observed risks are of comparable magnitude across studies done in many countries and controlling for a variety of the other risk factors for heart disease strengthens the confidence once can have in reaching the conclusion that passive smoking causes heart disease."*[70]

As this statement implies, the epidemiological evidence has been immeasurably strengthened in recent years by research into the physiological and biochemical mechanisms by which ETS causes heart disease and other illnesses. Non-smokers who inhale the toxic gases, particles and chemicals from both the lighted end of a cigarette and from the smoker's own exhalation, take nicotine, carbon monoxide and other substances into their own bloodstreams.

After half an hour, the blood pressure and heartbeat of these non-smokers has been found to rise measurably, indicating extra stress placed on the heart.[71] It is now known that second-hand smoke has both short-term toxic effects and long-term permanent effects on heart health, and that it contributes to the development of atherosclerosis .

Passive smoking reduces the blood's ability to deliver oxygen to the heart, because the carbon monoxide in ETS displaces and competes with oxygen for binding sites on red blood cells. Passive smoking also reduces the ability of the heart muscle to convert oxygen into the energy molecule adenosine triphosphate. These effects reduce exercise capability in people breathing second-hand smoke.[72]

Second-hand smoke also increases platelet activity, accelerates atherosclerotic lesions, and increases tissue damage following ischemia or myocardial infarction. Increased platelet activity increases the likelihood of acute thrombus (blood clot) formation, can damage the lining of the coronary arteries, and is an independent risk factor for recurrent or more serious myocardial infarction.[73]

Passive smokers have significantly thicker carotid artery walls, in a dose-response relationship, than people who are not exposed to ETS. As well, free radicals induced by passive smoking are also extremely destructive to the heart muscle cell membrane. Other studies have demonstrated that exposure to ETS may lower levels of high-density lipoprotein cholesterol (HDL-C) and increase fibrinogen, which in turn can lead to increased thrombogenesis.[74]

Indeed, it has been suggested that exposure to sidestream smoke may be proportionately more toxic to the heart than exposure to mainstream smoke. Sidestream smoke is emitted from the burning end of a cigarette and enters directly into the environment. Mainstream smoke is first drawn through the cigarette into the smoker's lungs, and then exhaled.

Among other factors, there are more carbon monoxide and nicotine breakdown products in dilute sidestream smoke than in mainstream smoke. Sidestream smoke also contains higher concentrations of several known carcingoens than the smoke inhaled by the smoker, including carcinogens like 2-naphthylamine, N-nitrosodimethylamine, and 4-aminobipheyl.[75] Overall, laboratory experiments have shown that condensate of sidestream smoke is more carcinogenic than that of mainstream smoke.[76] There are also consistently higher levels of other known toxic agents in sidestream smoke than in mainstream smoke.[77]

Rather than a single component of the smoke being responsible, however, the accumulated evidence indicates that many different components of second-hand smoke, including carbon monoxide, nicotine, and polycyclic aromatic hydrocarbons, may damage the cardiovascular system in a variety of ways.[78]

The most recent evidence has confirmed, for the first time, direct biological links between second-hand smoke and artery damage, and demonstrates that second-hand smoke leads to an accumulation of fat in the arteries. The evidence is particularly troubling because that damage is extremely difficult to reverse, and because clogging and hardening of the arteries leads to heart attacks and strokes and is the single leading cause of death in North America. The policy implications of the latest findings are profound. According to Richard Daynard at Northeastern University:

*"Now you have hard biological evidence that (exposure to ETS) irreversibly damages arteries. The study likely spells the end of smoking in shared public places in the United States."*[79]

The recent accumulation of strong evidence demonstrating the links between ETS and heart disease is a graphic illustration of the importance of applying the precautionary principle, discussed in Part One. As early as 1988, it was first estimated that 32,000 heart disease deaths among nonsmokers in the U.S. were attributable to ETS, somewhat fewer than later estimates (using completely different data and assumptions) of 35,000 to 62,000 annual excess heart disease deaths due to passive smoking.[80]

Had protections against ETS exposure been put in place when the evidence first came to light, it is likely that tens of thousands of lives could have been saved, and hundreds of thousands of cases of chronic illness avoided in North America. Indeed it is almost inconceivable that in 2001, most Nova Scotian restaurant, bar and casino workers are still involuntarily exposed to such high doses of a toxic, dangerous and potentially fatal substance for prolonged periods on a daily basis. Indeed, researchers have pointed to a double standard in the regulatory process:

*"Individual lifetime excess risks of heart disease death due to ETS of one to three per 100 can be compared with much lower excess risks of one death per 100,000, which are often used in determining environmental limits for other toxins."*[81]

*"In fact, there is no other consumer product to which large numbers of Ontarians are exposed on a daily basis with few or no restrictions that generates by-products as carcinogenic or toxic as second-hand smoke."*[82]

The mechanisms that underlie the development of both heart disease and cerebrovascular disease (stroke) have much in common. Atherosclerosis, platelet aggregation, and the formation of thrombi and thromboses can lead to both heart disease and strokes. Not surprisingly, therefore, given the evidence discussed above, recent studies have found that the risk of stroke is twice as high for those living with smokers than for those living with non-smokers, after adjustment for active smoking, education, heart disease, hypertension and diabetes.[83]

It must be noted that many of the more recent discoveries about the health hazards of environmental tobacco smoke, such as its link to stroke and breast cancer, have not yet been incorporated into the mortality statistics assessing deaths due to ETS. It can therefore be expected that as research progresses, the current estimate that 200 Nova Scotians die annually from exposure to ETS will be seen to be conservative.

## 2.4 ETS and Respiratory Illness

The link between second-hand smoke and childhood respiratory ailments, including bronchitis, pneumonia and asthma, has been well established. Much less research has been done on ETS and adult respiratory problems. Recent studies found that ETS elevates the risk of pneumococcal pneumonia, adult asthma, chronic bronchitis and emphysema, and increases the incidence of cough, phlegm, and days lost from work in workers exposed to second-hand smoke.[84] The

California Environmental Protection Agency has also reported that sensory eye and nasal irritation can result from ETS-related noxious stimulation of upper respiratory tract and corneal mucous membranes. And the study found suggestive evidence of a causal association between ETS exposure and both cystic fibrosis and decreased pulmonary function.[85]

Similarly, the United States Environmental Protection Agency found that:

> *"Environmental tobacco smoke has subtle but significant effects on the respiratory health of non-smokers, including reduced lung function, increased coughing, phlegm production, and chest discomfort."*[86]

However, the study that is most relevant to the proposed Nova Scotia workplace legislation is one by Dr. Mark Eisner of the Division of Pulmonary and Critical Care Medicine, Department of Medicine, University of California, San Francisco. Dr. Eisner and his colleagues studied the respiratory health of San Francisco bartenders before and after the legislative prohibition of smoking in all bars and taverns in California from January 1, 1998.

Self-reported ETS exposure among the interviewed bartenders declined from a median of 28 hours per week before the smoking ban (testing in December, 1997) to 2 hours per week afterwards (testing in February, 1998).[87] Previous studies have found dramatic reductions in indoor airborne nicotine concentrations and respiratory suspended particulate concentrations following smoking bans, suggesting that reduced ETS exposure may have an effect on respiratory health.[88]

Before the ban, 74% of the interviewed bartenders reported respiratory symptoms, including wheezing, dyspnea (shortness of breath), morning cough, cough during the rest of the day or night, and phlegm production. Symptoms were assessed using the International Union Against Tuberculosis and Lung Disease Bronchial Symptoms Questionnaire. Within two months of the ban, 59% of these previously symptomatic bartenders no longer reported respiratory symptoms.

Before the ban, 77% of bartenders also reported ETS-related sensory irritation symptoms, including red, teary or irritated eyes; runny nose, sneezing or nose irritation; and sore or scratchy throat. Following the ban, 78% of these previously symptomatic bartenders were free of symptoms.

In addition, spirometry tests were conducted both before and after the smoking ban to assess lung function, using the standard protocols of the American Thoracic Society Guidelines. After the smoking ban, researchers found improvements in bartenders' mean forced vital capacity and mean forced expiratory volume, both of which measure lung function. Based on both the interview and spirometry results, the researchers concluded:

> *"Establishment of smoke-free bars and taverns was associated with a rapid improvement of respiratory health....Our study demonstrates that reduced ETS exposure, occurring after implementation of smoke-free workplace legislation, as associated with improved adults respiratory health during a short observation period. In addition to potentially reducing the long-term risk of lung cancer and*

*cardiovascular disease, workplace smoking prohibition appears to have immediate beneficial effects on adult respiratory health."*[89]

The University of California study examined the immediate, short-term respiratory effects of the smoking ban rather than chronic long-term respiratory conditions like chronic obstructive pulmonary disease (COPD), which can be fatal. It is well established that active smoking causes a decline in lung function that is irreversible, with an average annual decline in lung volume two to three times as great as the normal decline in volume that occurs with age in non-smokers.[90]

Self-reported obstructive lung disease *has* been associated with ETS exposure in several studies.[91] But because of the time span necessary to assess results, long-term clinical data establishing the decline over time in lung volume and lung function due to ETS exposure are not yet available.

However, it is logical that the acute short-term symptoms reported by Eisner and his colleagues prior to the California smoking ban also have serious long-term implications for lung volume and function that could potentially increase the risk of COPD in chronically exposed workers. Because these long-term respiratory conditions are life-threatening, application of the precautionary principle requires that the respiratory health of restaurant, bar and casino workers be protected.

Based on the accumulated medical evidence, health authorities have unambiguously called for rigorous smoking restrictions that will eliminate involuntary exposure to environmental tobacco smoke. To take just three examples:

Dr. David Satcher, U.S. Surgeon-General and U.S. Assistant Secretary for Health called for *"clean indoor ordinances requiring 100 percent smoke-free environments in all public areas and workplaces, including all restaurants and bars."*[92]

The United Kingdom Scientific Committee on Tobacco and Health stated that *"smoking in public places should be restricted on the grounds of public health.... Wherever possible, smoking should not be allowed in the workplace."*[93]

The World Health Organization's International Program on Chemical Safety has recommended: *"In order to avoid interaction with occupational exposures, and to eliminate the risks of exposure to environmental tobacco smoke, smoking in the workplace should be prohibited."*[94]

And the Ontario Tobacco Research Unit at the University of Toronto stated unequivocally that: *"All involuntary exposure to tobacco smoke is harmful and should be eliminated."*[95]

## 2.5 Do Designated "Non-Smoking" Areas Provide Protection from ETS?

Opponents of smoke-free legislation have argued for a "compromise" that dedicates a portion of restaurant, bar and casino seating for non-smoker use. However, all available evidence indicates

that dedicating a portion of existing space for non-smoking patrons does not eliminate exposure to ETS, and that these restrictions may be fictitious.[96]

Reviewing the evidence, the U.S. Surgeon-General concluded that *"simple separation of smokers and non-smokers within the same air space may reduce, but does not eliminate exposure of non-smokers to environmental tobacco smoke,"* a finding confirmed by the U.S. National Research Council.[97] And Health Canada has determined that there is *"no known safe level of exposure to carcinogens"* of which environmental tobacco smoke is one.[98]

For employees, separation of smokers and non-smokers appears to provide no protection at all. A study examining the cotinine levels of casino workers found that levels among workers at "non-smoking" gaming tables were actually higher than the average, indicating that there was no decreased exposure to ETS at these tables. That study, conducted for the U.S. National Institute for Occupational Safety and Health (NIOSH), concludes:

> *"NIOSH has determined that ETS poses an increased risk of lung cancer, other lung disease, and possibly heart disease to occupationally exposed workers....NIOSH recommends that workers not be involuntarily exposed to tobacco smoke."*[99]
>
> *"The best method for controlling worker exposure to ETS is to eliminate tobacco use from the workplace and to implement a smoking cessation program for employees. The 'non-smoking' tables, as currently situated, did not measurably decrease employee exposure to ETS."*[100]

After extensively reviewing the medical literature on designated smoking areas[101], the American College of Occupational and Environmental Medicine (ACOEM) concluded (July 30, 2000), issued a carefully worded statement that had been peer reviewed by three scientific committees. The statement concluded that:

> *"...Simple separation of smoking and non-smoking indoor workers fails to prevent involuntary exposure to ETS, possibly blunting the epidemiological impact of a smoke-free workplace policy. Nonsmokers working at a workplace with a "work area only" smoking restriction were more likely to be exposed to ETS than those working at a completely smoke-free worksite. Designated smoking areas do not work well to protect non-smokers – total bans work more effectively by increasing awareness of policy....*
>
> *Theoretically, clean indoor air could be achieved by segregation of smokers with effective engineering controls. However, banning workplace smoking most effectively achieves the desired result. Smoking bans are less expensive, more effective, and more amenable to audit."*[102]

The ACOEM also explicitly included bars, casinos and restaurants in its recommendations for the complete elimination of ETS from the workplace, and stated that the bans should apply to all

visitors and customers as well as employees. It also recommended that such smoking bans be accompanied by voluntary personal smoking cessation programs for employees.[103]

This conclusion is supported by a comparative study of different levels of restriction and protection at different California work sites. The researchers found that non-smokers in work places with only partial bans were nearly three times more likely to be exposed to ETS than those working in a smoke-free work site. They concluded that *"a limited policy offers no advantage over no policy at all....(T)he only way to protect nonsmokers' health is with a smoke-free work site."*[104]

There is another and completely different argument against separately ventilated smoking rooms. Concerns about ETS focus almost exclusively on its impacts on non-smokers. But one study concludes that these smoking rooms significantly increase lunch cancer mortality risks among smokers. *"Put simply,"* the researchers conclude, *"a total workplace ban will prevent many premature deaths among smokers."*[105]

Indeed, critics of separately ventilated smoking rooms argue further that they are expensive for small employers; they will not help employees in restaurants and bars; they are contrary to the objectives of public health policy; and they could be the basis for liability action because the employer has created an unsafe environment.[106]

## 2.6 Do Ventilation and "Courtesy of Choice" Provide Protection from ETS?

Opponents of smoke-free legislation have also argued that ventilation systems can protect workers from the health effects of second-hand smoke. Indeed the Canadian Tobacco Manufacturer's Council has given the Hotel Association of Canada $3.2 million to implement its "Courtesy of Choice" program, *"which involves effective ventilation and filtration systems to ensure that smoke and other contaminants in the air are removed."*[107] The industry claims:

> *"Courtesy of Choice makes it possible for smokers and non-smokers to live in harmony. Impossible? Not so. Courtesy of Choice is an internationally accepted program designed to help hotels accommodate the needs of both their smoking and non-smoking guests. It is a program of self-regulation that uses scientific air-flow analysis to guarantee that non-smoking areas are truly smoke-free."*[108]

The "Courtesy of Choice" program has been adopted by the Hotel Association of Nova Scotia (HANS), and includes the following participating Halifax hotels: Holiday Inn Select, Cambridge Suites Hotel, The Prince George Hotel, Sheraton Halifax, and Holiday Inn Harbourview. A HANS brochure states:

> *"Courtesy of Choice uses outside engineers to evaluate the ventilation and identify directional air flow to ensure that smokers are located 'downwind' of non-smoking customers."*[109]

This study does not deal with the issue of industry "self-regulation" except to note in passing that other Class A carcinogens, such as asbestos, mustard gas and coke oven emissions, and other

designated toxic chemicals are not subject to industry self-regulation, but are highly regulated by government to ensure safety. For example, Ontario regulates 587 chemicals in the workplace, including eleven "designated chemicals" to which special rules apply. Six of these eleven substances (acrylonitrile, arsenic, benzene, lead, mercury and vinyl chloride) are present in tobacco smoke.[110] As well, other public health hazards like fire safety and toxic wastes are also not left to voluntary self-regulation.[111]

However, it *is* essential to examine industry claims that ventilation can "ensure" and "guarantee" that ventilation "removes" tobacco smoke and its toxic constituents, that its analysis is "scientific," and that "non-smoking areas are truly smoke-free." The most recent detailed analysis of ventilation technologies, by the Ontario Tobacco Research Unit at the University of Toronto (May, 2001) is definitive in its answer to this question:

> *"Accommodation of tobacco smoke in the workplace, the solution proposed by the tobacco industry, was found to have no basis in science or public health protection. Its advocacy by members of the hospitality industry is similarly lacking in public health motivation.... (T)here are no scientific findings or public health protection principles underlying the notion of the safe accommodation of tobacco smoke in indoor air.*
>
> *"Given all knowledge accumulated to date in the health, risk assessment and ventilation sciences, it is most unlikely that tobacco smoke in indoor environments could ever be reduced to safe levels through the application of ventilation technology.... The ventilation system capable of removing tobacco smoke from the air does not exist....*
>
> ***"Ventilation provides no solution to the problem of exposure to second-hand tobacco smoke."***[112]

A separate review of the published health literature on ETS exposure found that *"health impacts are still substantial even under ventilated conditions."*[113] Separate smoking and non-smoking areas on the same ventilation system have been found to expose non-smokers to recirculated tobacco smoke.[114] One analysis concluded that even the most sophisticated ventilation systems would have to improve by a factor of 2000 *"in order to meet the level of public health protection normally expected against environmental contaminants."*[115]

The study of casino workers cited above found ETS exposure levels at least three times higher than in offices where smoking is allowed, *despite* adequate ventilation that met the recommendations of the American Society of Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE) for casinos . Carbon dioxide measurements in the casino indicated that adequate outside fresh air *was* being provided to the casino floor at the time of the evaluation, further indicating that ventilation systems did not adequately protect employees from the toxins in second-hand smoke.[116]

An earlier study by the Canadian Centre for Occupational Health and Safety, concluded:

*"...it is almost impossible to remove tobacco smoke from buildings by ventilation or other means such as electrostatic filters.... Also standard filtration systems in buildings do not remove carbon monoxide or any of the other gases present in tobacco smoke.... Many researchers have concluded that attempts to overcome tobacco smoking contamination by ventilation are futile, since they require ventilation rates far in excess of what is economical."*[117]

Although adequate ventilation can help dilute some air contaminants including nicotine, it does not eliminate environmental tobacco smoke, and it does not provide protection for employees from ETS exposure or its adverse health impacts. Even the best air-cleaning systems, *if* properly operated and maintained, which is often not the case, remove only some of the toxic components of tobacco smoke. *"In practice,"* concluded one analysis, *"mechanical ventilation systems alone are not a satisfactory alternative to banning or restricting smoking."*[118]

This is a vital issue, given arguments by the tobacco industry and its affiliates that adequate ventilation can protect restaurant, bar and other hospitality industry patrons and workers from ETS. In June, 1998, a panel of ventilation experts was assembled by the U.S. Federal Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists (ACGIH) specifically to assess whether existing ventilation engineering controls can adequately protect workers and patrons in the hospitality industry.

The expert panel concluded that well-mixed dilution ventilation, used in virtually all mechanically ventilated buildings (about 99% of current installations), does not control second-hand smoke in the hospitality industry, including restaurants, bars and casinos. The panelists also noted that building ventilation codes are not routinely enforced. They noted that potentially more effective (but still unquantified) displacement ventilation technologies were not familiar to most ventilation engineers and would face difficulties both aesthetically and in retrofitting existing installations.[119]

An analysis of the panel's findings further applied reliable mathematical models for predicting pollutant concentrations from indoor smoking to the ventilation rates that would be needed in order to meet accepted indoor air quality standards for ETS, as defined in the scientific literature and in risk assessment procedures. The analysis concluded:

*"Using this procedure, it is clear that dilution ventilation, air cleaning, or displacement ventilation technology even under moderate smoking conditions cannot control ETS risk to* de minimis *levels for workers or patrons in hospitality venues without massively impractical increases in ventilation.*

*Although there is a scientific consensus that ETS is a known cause of cancers, cardiovascular diseases, and respiratory diseases, although ETS contains 5 regulated hazardous air pollutants, 47 regulated hazardous wastes, 60 known or suspected carcinogens, and more than 100 chemical poisons, the tobacco industry denies the risks of exposure, opposes smoking bans, promotes ventilation as a panacea for ETS control, and works for a return to* laissez-faire *concerning smoking in the hospitality industry.*

*Smoking bans remain the only viable control measure to ensure that workers and patrons of the hospitality industry are protected from exposure to the toxic wastes from tobacco combustion."*[120]

The United States Occupational Safety and Health Administration (OSHA) risk assessment procedures define a "significant risk of material impairment of health" as equivalent to a 45-year working lifetime risk level of one death per 1,000 workers at risk. By that standard, it has been estimated that excess mortality for workers in smoking lounges, bars, restaurants, casinos and bowling alleys is 15-26 times higher than OSHA's significant risk level. That excess mortality is also 150-260 times higher than the one in ten thousand *highest* level of acceptable risk defined by the Canadian Environmental Assessment Agency.[121]

Even if effective ventilation technologies for controlling tobacco smoke were available, it is highly doubtful whether the vast majority of smaller businesses, including most restaurants and bars, could afford to install them. For example, a recent random survey of 401 Quebec restaurants found that most restaurateurs would not build a ventilated smoking section because of technical and financial reasons.[122] Even if constructed, such enclosed smoking sections would not protect food service and maintenance workers required to enter them.

A recent revision to the internationally accepted ASHRAE ventilation standards, the most widely observed code of ventilation practice in Canada, accepts this conclusion. The 1999 revision (ASHRAE Standard 62-1999: *Ventilation for Acceptable Indoor Air Quality)* accounted for new knowledge on the health effects of ETS by removing an existing provision on ventilation rates for second-hand smoke. ASHRAE now applies ventilation rates only to air that is already free from tobacco smoke, and it refers instead to health authorities and scientific agencies that have determined that there should be no exposure to ETS.[123]

Reviewing the ASHRAE procedures, the Ontario Tobacco Research Unit at the University of Toronto noted:

*"In revising its standard, ASHRAE adhered to a time-tested principle of sound public health and ventilation engineering practice. First, remove known sources of air pollution, and only then apply air cleaning and ventilation techniques. Revised standard 62-1999 adheres closely to this principle. ASHRAE no longer provides ventilation standards for air with tobacco smoke in it, only for air in smoke-free buildings.*

*To sum up, ASHRAE, the premier ventilation rate standard-setting agency in the world has said, in essence, the only air for which it sets ventilation standards is air that is already smoke-free."*[124]

ASHRAE has further concluded that no air cleaning technology current exists to effectively reduce tobacco smoke to levels that would provide adequate public health protection. The Ontario Tobacco Research Unit analysis noted that development of new technology capable of

removing or reducing most of the more than 100 toxic agents from air polluted by tobacco smoke is unlikely.[125]

In short, empirical evidence (e.g. cotinine levels of casino workers in a well-ventilated environment), scientific risk assessment procedures, expert assessment and analysis of existing ventilation technologies, and internationally accepted ventilation standards all definitively refute the advertising claims of the "Courtesy of Choice" program. By contrast, they confirm the most recent findings of the Ontario Tobacco Research Unit that "ventilation provides no solution to the problem of exposure to second-hand smoke," especially for hospitality industry workers, and they direct attention back to simpler, more effective, and vastly cheaper workplace smoke bans.

## 3. Economic Costs of Passive Smoking

The economic costs of active smoking have been well established. However very few cost estimates include the costs of exposure to second-hand smoke. It is estimated that 80% of a non-smoker's exposure to environmental tobacco smoke occurs in the workplace.[126] There is no doubt, therefore, that a province-wide workplace smoking ban can drastically reduce the incidence of lung cancer, heart disease, other cancers and respiratory problems suffered by non-smokers due to second-hand smoke, and the health care costs of treating these illnesses.

Productivity losses due to second-hand smoke exposure have also been documented, with days lost from work higher among workers exposed to ETS.[127] One analysis notes that *"the presence of persistent ETS exposure is found to increase sick-time and replacement costs for the employer."*[128] Additional costs to the economy accrue as a result of productivity losses due to ETS-related premature deaths from lung cancer, heart disease and other cancers.

Because the cost categories are comparable, it is worth extrapolating from previous estimates of the health care and productivity costs of smoking-related illnesses to derive at least a rough estimate of the potential savings that could be realized through the proposed legislation. As discussed in Part One, such an estimate is essential if the overall economic benefits and costs of a workplace smoking ban are to be assessed within a full-cost accounting framework.

As noted above, ETS is implicated in both fatal and nonfatal cardiac events, and it is associated with both lung cancer and with shorter-term acute respiratory symptoms. For the purposes of this costing exercise, it is therefore assumed that illness-treatment costs due to ETS exposure are proportional to comparative mortality rates between active and passive smoking.

Previous Health Canada and GPI Atlantic estimates indicate that active smoking kills 1,650 Nova Scotians every year and costs the Nova Scotia health care system $168 million in direct health care costs. Smoking has a grave impact on life expectancy and disability. Recent Statistics Canada data indicate that 55% of 45-year-old non-smoking men can expect to live to age 80 while only 30% of 45-year-old men who smoke can expect to live to age 80. Similarly for women, 70% of nonsmokers aged 45 can expect to live to age 80, while only 40% of smoking women of that age will reach age 80.[129]

Above and beyond direct costs to the health care system, productivity losses due to premature death and absenteeism add another $360 million annually in economic losses, for a total cost to the provincial economy of more than half a billion dollars a year.[130] Smoking is by far the most costly and destructive preventable cause of illness.

Table 1 extrapolates from these figures to give a rough estimate of the probable economic costs of passive smoking. Since 80% of ETS exposure is in the workplace, estimates are also given of the potential long-term economic savings that can eventually be realized due to an 80% reduction in ETS exposure through a province-wide workplace smoking ban.

**Table 1: Estimated Costs of Passive Smoking, NS, 1999, and Estimated Future Annual Savings of Workplace Smoking Ban (1999$ millions)**

| | Costs | Savings @ 80% |
|---|---|---|
| Deaths | 200 | 160 |
| Potential years of life lost | 2,900 | 2,320 |
| Hospitalizations | 1,400 | 1,120 |
| Hospital Days | 15,000 | 12,000 |
| ***Direct Health Care Costs ($1999 millions)*** | | |
| Hospitals | 15.2 | 12.2 |
| Ambulance Services | 0.3 | 0.2 |
| Physician fees | 1.5 | 1.2 |
| Prescription Drugs | 3.2 | 2.6 |
| Other Health Care Costs | 0.3 | 0.2 |
| **Total Direct Health Care Costs** | **20.5** | **16.4** |
| ***Indirect Costs ($1999 millions)*** | | |
| Productivity loss (sickness) | 0.7 | 0.6 |
| Productivity loss (mortality) 6% discount rate | 57.1 | 45.7 |
| **TOTAL** | **77.6** | **62.1** |
| **Total per capita *($1999)*** | **$82** | **$66** |

Source: Relative cost estimates are based on costs of tobacco in Canadian Centre for Substance Abuse, *The Costs of Substance Abuse in Canada,* adjusted according to the considerations described in Colman, *The Cost of Tobacco in Nova Scotia,* pages 15-20, and according to the comparative mortality rates for active and passive smoking in Glantz and Parmley, (1995), op. cit., and Steenland, op. cit.. All costs are adjusted from 1992 to 1999 dollars using the Canada and Nova Scotia Consumer Price Index for "health care" for health care costs, and for "all items" for all other costs.

In sum, it is likely that passive smoking currently costs the Nova Scotia health care system more than $20 million a year, and produces total economic losses of nearly $80 million annually. A workplace smoking ban could eventually save Nova Scotia $16 million in avoided health care costs and another $46 million in avoided productivity losses, for total economic savings of more than $60 million a year.

The full savings listed in Table 1 will not accrue immediately after a smoking ban comes into effect, as past exposure to ETS will continue to produce health care costs for a period of time.

However the savings *begin* to accrue immediately, and then grow rapidly as lung cancer and coronary heart disease risks due to ETS decline dramatically.

Many health effects of tobacco smoke are reversible within days or weeks, including non-chronic respiratory problems and some symptoms associated with cardiovascular disease.[131] That these immediate and short-term benefits apply to exposure to ETS is demonstrated by Eisner's assessment of the respiratory health of bartenders before and after the California smoking ban (see Section 2.4 above.) Eisner's results translate into immediate economic savings in avoided physician and drug costs.

The American Cancer Society's study of one million men and women found that within 2-4 years, light smokers reduced their risk of lung cancer death by two-thirds, and after five years had no greater risk than those who never smoked.[132] The same study found that former light smokers reduced their risk of death from coronary heart disease by half within five years, with a complete return to non-smoker risk levels after the 10th year of cessation.[133]

It has been estimated that working in a smoke-filled environment has the same long-term health effect as smoking ten cigarettes a day.[134] If ETS-related risks are comparable with those of light smokers, it can therefore safely be assumed that most of the annual savings cited in Table 1 will be realized within 5-10 years of a workplace smoking ban.

## 3.1 Additional Savings due to Reduced Smoking Rates

However, the estimates in Table 1 still underestimate the potential economic savings of a province-wide workplace smoking ban, because they account only for the costs of *passive* smoking and for avoided ETS-related costs. In actual fact, a workplace smoking ban would produce considerable additional savings in reduced *active* smoking prevalence and cigarette consumption, reduced direct employer costs, and lower start-up rates.

Many studies have associated workplace smoking bans with decreased personal cigarette consumption by smokers, higher quit rates, and reduced smoking prevalence. This is especially true when workplace smoking bans are strictly enforced, when they are combined with effective workplace smoking cessation programs, and when they are part of a comprehensive tobacco control strategy.[135]

For example, the proportion of smoke-free workplaces in California almost doubled between 1990 and 1993, cutting non-smokers' overall exposure to ETS by an estimated 25%. Maintaining a smoke-free workplace was independently associated with a 14% overall decline in smoking prevalence, a 26% decrease in per capita cigarette consumption, and increased quite rates over time. By contrast, smoking prevalence and consumption increased among smokers who moved from smoke-free to smoking-allowed work sites between 1990 and 1992. Another study based on the 1990 California Tobacco Survey found that cigarette consumption among indoor employees was 21% below what it would be without restrictions.[136]

An evaluation of the impact of 1986 smoking restrictions at Health and Welfare Canada found quit rates well above the national average, a small overall reduction in daily cigarette consumption among smokers, and a much larger decrease in the mean number of cigarettes smoked at work. A key feature of that policy and other successful workplace smoking bans was a self-help smoking cessation program.[137] A 1990 study of the smoking ban at Baltimore's Johns Hopkins Hospital, which was also supported by workplace smoking cessation programs, found that total daily cigarette consumption among smokers decreased by 25%.[138]

A 1991 study among Telecom Australia employees 18 months after a total workplace smoking ban found smokers consuming 3-4 cigarettes less per workday, and a quit rate double that of the community average. The same study found that 75% of surveyed staff reported positive effects on work productivity as a result of the smoke ban. And another study in 1992 found smokers consuming an average of five fewer cigarettes per day after enactment of workplace smoking bans, with no apparent compensation during leisure time.[139]

These results have also been confirmed by physiological tests that have measured smoking amounts and toxic exposure. An average one-pack-per-week reduction among smokers following enactment of workplace smoking restrictions did not lead smokers to compensate either by increasing their cigarette consumption outside work or by smoking more intensively.[140]

It has been suggested that comprehensive workplace smoking bans strengthen the perception of the social inappropriateness of smoking and discourage smoking start-up. One study found that smoking bans reduce smoking cues, smoking opportunities and smoking role models.[141] A comparative study in Canada found that the likelihood of being a smoker is reduced where anti-smoking bylaws are widespread, even after age, sex, education and marital status are controlled. The study concluded that legislated restrictions are effective not just in protecting non-smokers from the harmful effects of second-hand smoke, but in controlling smoking itself.[142]

Based on these studies, it can be estimated that Nova Scotia daily smokers not currently subject to workplace smoking restrictions would consume an average of four fewer cigarettes per day after a smoking ban comes into effect, with an average reduction of about 23% in their daily consumption on work days. Because there is a dose-response relationship between intensity of smoking and health outcomes, this reduced consumption by smokers will translate into further health care savings.

When this reduced consumption by current smokers is combined with higher anticipated quit rates and reduced smoking prevalence, it is estimated that a comprehensive workplace smoking ban could reduce current cigarette consumption in Nova Scotia by 20%, bringing it in line with the current Canadian rate. This reduction would eventually save the health care system an *additional* $20 million a year beyond the avoided ETS-related costs, and would save the economy an additional $80 million a year when avoided productivity losses are added.[143]

These savings do not include the $56 million annual direct savings to smokers themselves from consuming 11 million fewer packs of cigarettes per year. Beyond the economic gains, a reduction of this magnitude would save 600 years of life per year for Nova Scotians, based on the additional anticipated life-span of quitters.[144]

## 3.2 Additional Economic Savings

In addition, based on Conference Board of Canada estimates, it costs Nova Scotian employers an estimated $250 million more a year, or $2,280 per smoking employee, to employ smokers rather than non-smokers, including on-the-job productivity losses, increased absenteeism costs, increased life insurance premiums, and smoking area costs.

This estimate is independently confirmed in a U.S. Congressional Office of Technology Assessment that estimates each smoker costs his employer between $2,000 and $5,000 annually in increased health care and fire insurance premiums, absenteeism, lost productivity and property damage.[145] Another study concludes that each smoking employee costs the employer more than $4,600 a year.[146]

Using the Conference Board of Canada's estimate, a complete workplace smoking ban, like that in California, would save Nova Scotia employers $10 million a year in avoided smoking area costs alone, and $8.5 million in lower insurance premiums. Productivity losses due to absenteeism have already been counted above and are therefore not included again here.[147]

As well, based on U.S. Environmental Protection Agency estimates, it is likely that avoided housekeeping, maintenance and damage costs due to smoking in public and work places would save Nova Scotian taxpayers and employers more than $20 million extra a year as the result of a smoking ban.[148] Other documented productivity losses due to workplace smoking include an injury rate double the non-smoking rate due to loss of attention, coughing and other distractions.[149]

Health Canada reports that the U.S. Building Owners and Managers Association now supports an outright ban on smoking in indoor workplaces on the grounds that smoking is the main cause of fires in office buildings, an additional cost in both economic and human terms.[150]

In addition to the costs and savings described above, there is mounting evidence that second-hand smoke actually reduces the work efficiency of non-smoking employees. A study conducted by the Canadian Centre for Occupational Health and Safety reported that 25% of non-smokers in workplaces that have no restrictions on smoking express frustration and hostility towards both smokers and management. Summarizing the evidence, the study concluded that:

> *"Smoking on the job increases absenteeism, property damage, and health and fire insurance costs. It can also lower the morale and productivity of some nonsmoking employees."*[151]

That conclusion is confirmed by psychological studies on interactions between smokers and non-smokers that have been found to have negative impacts on work performance. Indeed, a U.S. Environmental Protection Agency cost-benefit analysis of proposed smoke-free legislation in the U.S. specifically predicted increased organizational efficiency due to reduced conflicts between smokers and non-smokers.[152] According to one study:

*"Nonsmokers hold negative stereotypes of smokers, suffer from depressed mood states when near a smoker, perform worse when around smokers, are more aggressive toward smokers, help smokers less than nonsmokers, and require more interpersonal distance when interacting with smokers."*[153]

The American College of Occupational and Environmental Medicine concluded, from an extensive review of the literature that was peer-reviewed by three scientific committees:

*"Strong economic incentives exist for rapid adoption of smoke-free workplaces. The costs to governments and private industry associated with the development and implementation of policies preventing worksite and public exposure to ETS are far less than the resulting economic gains.*

*Economic benefits derived from improved health and increased productivity have been well documented for workers and employers, and so have the benefits realized from decreased time invested in smoking behaviors.*

*An additional economic incentive may be the wish to avoid the costs of litigation based on claims of employer liability for occupational exposures to ETS, an area of case law that has been accumulating since the 1970s. Workplace smoking bans limit that risk."*[154]

## 3.3 Litigation Costs and Legal Requirements

The potential for litigation is raised in recent Health Canada documents suggesting that existing provincial occupational health and safety (OHS) legislation and the Canada Labour Code could be used to restrict ETS exposure in the workplace. A 1995 analysis of the Ontario Occupational Health and Safety Act identified 11 distinct ways in which the provincial Act could be used to eliminate workplace ETS.[155]

A recent Health Canada ETS workshop specifically recommended that OHS laws be used to regulate ETS *"because such laws require employers to provide a safe working environment"*:

*"It may be possible for employees to use provisions of OHS laws to obtain enforcement of restrictions. In principle, they should have the right to refuse to work in environments with high levels of ETS....Other aspects of Canadian OHS legislation that could apply indirectly to ETS include the regulation of substances found in tobacco smoke (possibly through the national Workplace Hazardous Materials Information System, or WHMIS)...."*[156]

Nova Scotia's own 1996 Occupational Health and Safety Act (chapter 7), section 13(1) requires every employer to *"ensure the health and safety of persons at or near the workplace"* and to ensure *"that employees are not exposed to health or safety hazards."* Accompanying regulations further specify that employers shall *"render harmless all gases, vapours, dust or other impurities that are likely to endanger the health or safety of any person therein."*[157]

Given the scientific knowledge about the adverse health effects of ETS and its classification by the US Environmental Protection Agency as a Class A carcinogen, even existing provincial regulations therefore open the way for potential lawsuits by restaurant, bar and casino employees exposed to ETS at the workplace.

Under the Ontario Occupational Health and Safety Act, for example, there are 17 chemicals present in tobacco smoke for which no exposure is currently allowed in the workplace according to provincial regulations governing known toxic agents. Therefore the Ontario Tobacco Research Unit (OTRU) at the University of Toronto has concluded that any presence of tobacco smoke in the workplace will indicate that the Act has been violated. In order to be in conformity with the existing Act, and to comply with current regulations, the OTRU concludes that tobacco smoke must be eliminated from Ontario workplaces. OTRU also notes that medical officers of health in the province have the authority under existing regulations to order compliance.[158]

Based on its analysis of proscribed chemicals currently regulated in the province, OTRU recommended that:

> *"The Ontario government move immediately to comply with existing laws and regulations by making all workplaces governed by the Ontario Occupational Health and Safety Act smoke-free...and take immediate steps to ensure that all other Ontario workplaces and public places are made smoke-free."*[159]

In addition to the legal provisions of occupational health and safety legislation, a landmark U.S. court case (Shrimp vs. New Jersey Bell Telephone Co.) also recognized that employers could be held liable to their non-smoking employees for violating their *common law* duty to provide a safe work environment. The court took judicial notice of the dangers of environmental tobacco smoke and held that employers must prohibit smoking in work areas.[160]

The extent and reach of potential litigation can be seen in a spate of U.S. class action lawsuits by employee groups claiming harm from second-hand smoke exposure endured on the job. For example, Florida flight attendants settled a class action suit based on ETS exposure for $349 million.[161]

More recently, Boston attorneys have planned a lawsuit against the tobacco industry, restaurants and even restaurant associations that have vehemently opposed smoking bans. The potential litigation costs illustrate the perils that exist for restaurant and hotel associations if they align themselves too closely with the tobacco industry and its objectives. According to attorney, Mark Gottlieb, of Northeastern University's Tobacco Control Resource Center:

> *"We felt that the evidence has been very strong linking the health problems of bar and restaurant workers to environmental tobacco smoke.... Normally, we would just focus on the tobacco industry. But here the actions of the restaurant owner may be relevant in terms of liability, so we're looking beyond the tobacco companies themselves."*[162]

Concern about potential litigation was one reason the California Restaurant Association (CRA), the largest restaurant trade group in that state, supported California's Smokefree Workplace Act and played an instrumental role in its passage. The CRA's constructive role and alignment with public health interests may be a model for Nova Scotia hospitality industry associations concerned both about employee health and owner liability.

> *"CRA leaders supported a statewide prohibition of smoking in restaurant dining rooms and bars to protect workers from secondhand smoke and employers from liability in civil and workers compensation cases tied to individuals claiming they were by on-the-job exposure to secondhand smoke."*[163]

From a legal perspective, it has also been argued that smokers' privacy rights and freedoms end at the point that they invade a non-smoker's physical and decisional privacy rights not to breathe environmental tobacco smoke. A *Georgetown Law Journal* commentary on that legal issue argues for a change in "*the presumption that smoking is permitted wherever it is not expressly forbidden, to a presumption that smoking is permitted only in designated areas.*" The author also notes that:

> *"The risks of liability for exposing a nonsmoking employee to environmental tobacco smoke combined with the increased costs of hiring smokers provide a significant incentive for employers to institute restrictive hiring policies."*[164]

## 3.4 Conclusion

When these additional savings are considered, it is clear that the secondary economic benefits of a comprehensive workplace smoking ban outweigh the direct economic savings due to avoided ETS-related illnesses.

***In total, it can be estimated that a comprehensive workplace smoking ban in Nova Scotia will save the province $40 million in direct health care costs, and an additional $150 million in avoided indirect costs and productivity losses, for total economic savings of nearly $200 million.***

This estimate, independently assessed by GPI Atlantic for Nova Scotia, is in line with results that would be derived by extrapolating from a 1994 U.S. Environmental Protection Agency cost-benefit analysis of proposed nationwide smoke-free legislation that would ban or restrict smoking in all non-residential indoor air environments. That EPA assessment concluded that such national legislation would produce net benefits of between $US39 and $72 billion.[165] Extrapolating directly for the Nova Scotia population, that would equal $136 - $252 million (1994US$) in savings for this province, or well over $200 million when converted to 1999 Canadian dollars.

To achieve these results and to reduce the costs of tobacco substantially, evidence in many jurisdictions demonstrates that a positive synergistic impact results from the interaction of several concordant anti-smoking strategies. For example, a study on Canadian tobacco control

efforts published in the *American Journal of Public Health* found that, while no-smoking bylaws and higher cigarette prices are both effective in controlling smoking, either alone will have less impact than the two measures together.[166]

In California, where a complete ban on workplace smoking, including restaurants and bars, is part of a comprehensive tobacco control strategy, youth smoking rates have fallen to 6.9%[167], compared to 30% in Nova Scotia[168]. This confirms the evidence presented above that public smoking bans contribute strongly to the social inappropriateness of smoking, and thus discourage smoking start-up. California's overall efforts have also proven highly cost-effective, with an estimated $3.62 in medical costs saved for every $1 invested.[169]

This suggests that the proposed Nova Scotia legislation on workplace smoking will be most effective when joined with a comprehensive tobacco control strategy, including substantially higher cigarette taxes, accessible and effective smoking cessation programs, youth prevention initiatives, anti-tobacco media campaigns, community-based programs, and monitoring, research and evaluation. The protection of workers and patrons from the harmful effects of second-hand smoke is best seen as one vital element in this larger strategy.

# PART III

## IMPACT OF WORKPLACE SMOKING BANS ON RESTAURANT, BAR AND HOTEL SALES

## 4. Impacts of Workplace Smoke Bans on Business: Methods

Part Two demonstrates that the economic impacts of a workplace smoke ban must be assessed within a full-cost accounting framework that includes "externalities," or societal costs borne by the taxpayer and the economy as a whole. The most important of these costs are clearly those associated with the health impacts of tobacco smoke, and include both direct health care costs, and indirect economic losses due to premature death and disability. Because the health impacts of second-hand smoke are now well established, these costs cannot be ignored in any benefit-cost analysis of the proposed legislation.

In addition, the preceding analysis demonstrates that the primary focus of a workplace smoking ban must be on protection of those employees who are subjected to the highest rates of second-hand tobacco smoke exposure, particularly restaurant, bar and casino workers. Evidence that ETS levels in bars are 4 to 6 times higher than in offices and residences with smokers, and that food-service workers have a 50% excess lung cancer risk indicates that protection of patrons is not the only, or even primary, goal of the proposed legislation.

Indeed, the accumulation of evidence on the health impacts of ETS raises the specter of legal liability for both businesses and government, which bear responsibility for the health and safety of employees at the work site. A recent British report notes: *"Workers in the hospitality industry have rights in common law, employment law, and health and safety law."* [170] The report noted that a U.K. casino croupier, backed by his union, is currently suing a casino for failing to provide protection against the harmful effects of environmental tobacco smoke.

In Australia, there have already been dozens of highly publicized workers' compensation cases involving exposure to second-hand smoke. In a precedent-setting case in 1992, a jury awarded $A85,000 to an asthmatic woman who took her employer to court arguing that her asthma had been aggravated by the tobacco smoke she was obliged to breathe at work. In 2001, an Australian bar worker was awarded over $A450,000 after developing throat cancer as a result of workplace exposure to second-hand smoke.[171] Australian surveys show that fear of litigation has now overtaken concern for workers' health as the main reason for introducing smoking bans.[172]

Clearly, therefore, business decisions, too, must be based on a wider cost-benefit analysis than sales alone, even if they do ignore externalities and social costs. It was noted in Part One that business impacts of smoke-free legislation include changes in employee productivity and absenteeism, maintenance and cleaning costs, operating and safety expenses, fire insurance premiums, customer and employee satisfaction, changes in the customer base, and potential litigation.

A 1996 Conference Board of Canada study accounting for some of these wider business impacts concluded that the evidence does *"not support the fear that going smoke-free would be detrimental overall for business."* [173]

Nevertheless, some members of the hospitality industry have, in the past, expressed fears that a workplace smoking ban would hurt restaurant and bar sales. Here in Halifax, Mr. Luc Erjavec of the Canadian Restaurant and Food Services Association responded to news of the proposed Nova Scotia legislation by stating that a smoking ban would hurt the restaurant and bar business.[174] No evidence for that claim was cited, and it is noteworthy that the Center for Hospitality Research at Cornell University's respected School of Hotel Administration has specifically responded to such claims in the past with the following unequivocal statement:

> *"At the very least restaurateurs should make business decisions based on data, not opinion. Ultimately, smoke-free legislation is likely to have a positive impact on restaurant industry revenues. Our advice to other cities and municipalities is to consider seriously similar legislation. The restaurant industry collectively may experience higher revenues through smoke-free legislation."*[175]

Thus, *even* if wider benefits and costs are ignored, which this report does not advocate, there is still a need to base narrower statements about the likely impacts of smoke-free legislation on sales revenues, hard data and evidence. Since the 1996 *Cornell Hotel and Restaurant Administration Quarterly* analysis of the impacts on restaurant revenues of New York City's Smoke-Free Air Act of April, 1995, there have been a number of other studies undertaken in various jurisdictions in the U.S. that have banned smoking in workplaces.

In preparation for Nova Scotia's own legislation, therefore, this report reviews the best available evidence to this point, and summarizes the results and conclusions of detailed studies conducted in California, Colorado, Massachusetts, New York, Arizona, Texas, Utah, Vermont, North Carolina, and British Columbia. The most objective and unbiased data sources for analysis of the economic impact of smoke bans on restaurant sales are official sales tax receipts spanning the period both before and after the legislation was passed, since these are both comprehensive and legally required.

Sales tax data reflect *all* restaurant sales in a particular jurisdiction, not just those of a small sample, and they can be considered reasonably accurate since it is a crime to report fraudulent figures to the U.S. Internal Revenue Service. Sales tax data are also collected through consistent methods by government agencies with no interest in the effects of smoking restrictions on sales, and can therefore be considered unbiased. The data are also verifiable and easy to obtain from state or local taxation departments.[176]

For all these reasons, it has been concluded: "*Of all the methods used to assess the economic impact of smoke-free laws, many researchers believe the use of taxable sales data to be the best approach available.*"[177] In order to exclude any potential reporting bias, this report examines the results of all published studies based on these objective sales tax data.

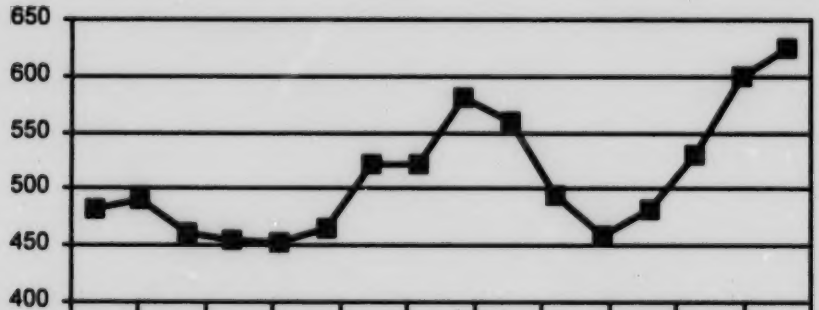
The best studies also control for possible fluctuations in the business cycle and for seasonal effects. This is done by (a) comparing restaurant, bar and hotel sales as a proportion of total retail sales before and after legislation; (b) comparing sales in jurisdictions with smoke-free legislation with sales in neighbouring and comparison jurisdictions without such legislation during identical

months; (c) considering sufficiently long time periods; and (d) comparing identical months before and after legislation.

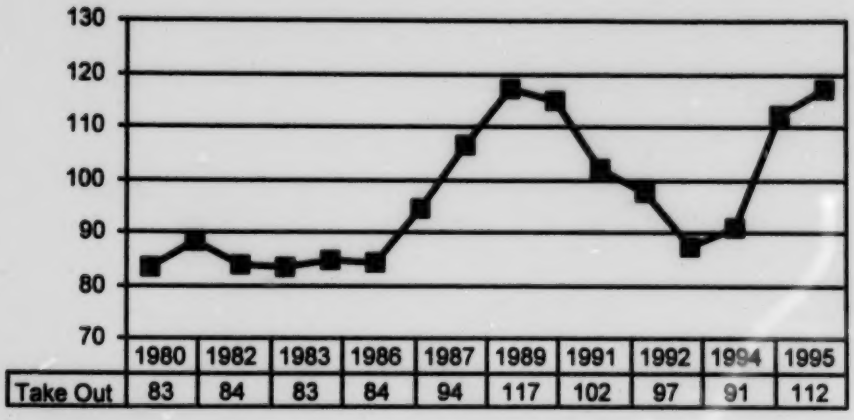
One study (5.8 below) further assesses revenue changes in particular locales against the economic health of the hotel and tourism industry at the national level. In order to control for general economic trends, seasonal effects and other factors that vary over time, these studies also use multivariate regression analysis that can remove the influence of such extraneous factors and facilitate au unbiased estimate of the particular effect of smoking restrictions on restaurant sales. The best studies use several different regression models and types of analysis in order to assess consistency in the results.

These controls are essential because eating at restaurants is not a "necessity" and is therefore particularly sensitive to the business cycle and to prices.[178] As Figures 1 and 2 below indicate, expenditures on restaurant and take-out food in Nova Scotia fell during the recessions of the early 1980s and 1990s and recovered during each economic upturn.[179]

**Figure 1: Restaurant and Take-Out Receipts, Nova Scotia, (1996$ millions)**




| | 1980 | 1981 | 1983 | 1985 | 1987 | 1988 | 1990 | 1991 | 1993 | 1994 | 1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Restaurants | 482 | 491 | 454 | 452 | 521 | 521 | 560 | 494 | 482 | 530 | 625 |




| | 1980 | 1982 | 1983 | 1986 | 1987 | 1989 | 1991 | 1992 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|
| Take Out | 83 | 84 | 83 | 84 | 94 | 117 | 102 | 97 | 91 | 112 |

Sources: Statistics Canada, *Restaurants, Caterers, Taverns Receipts*, no. M52, Nova Scotia, annual reports, adjusted to constant 1996$, using the Nova Scotia Consumer Price Index for "Food Purchased from Restaurants", Statistics Canada, CANSIM database 7466, P 803032.

Needless to say, changes in the tourist trade, seasonal fluctuations, and increased competition are other major factors influencing restaurant receipts. This indicates that it is important not to attribute changes in restaurant sales revenues to smoke-free legislation alone, but to account for seasonal, business cycle and other fluctuations that can be substantial. For this reason, it is also necessary to supplement sales revenue data with survey data assessing whether patrons are dining out more or less often as a result of smoke-free legislation.

Finally, distinctions must also be made between short-term and long-term impacts. A *mandatory* smoke ban enforceable in law may have the immediate impact of discouraging smokers from dining out, while *voluntary* changes in behaviour may take longer to manifest. Since business investments and decisions assess profitability over the longer term, a sufficient time span must therefore be allowed to examine the impact of smoke-free legislation on business.

## 5. Impacts of Workplace Smoke Bans on Sales: Results

It is clear from the caveats above that simple-minded equations between smoke-free legislation and sales may potentially be misleading. The studies cited below are based on actual sales tax data, and they have all, to a greater or lesser extent, taken potentially confounding factors into account. The dates cited in the sub-headings refer to the date of publication of the studies themselves, not to the date of the smoke-free ordinances.

Based on an extensive literature search and review, the author believes the following summary to be a complete survey of *all* published studies that use taxable sales receipts to examine the economic effects of smoke-free restaurants. The results are also supplemented here with survey data to test the robustness of the results. Finally, an important survey before and after enactment

of smoke-free legislation tested whether restaurant proprietors' initial concerns had been borne out by actual experience.

Some of the most comprehensive studies to date on the economic impacts of smoke-free legislation emanate from California, which has taken the lead in protecting its residents from tobacco smoke in public places and workplaces. Protection is now guaranteed by local ordinances (bylaws) in hundreds of towns and cities in the state, and the *1995 California Clean Air Act* provides statewide protection from second-hand smoke.

On January 1, 1998, that law was extended to cover bars and bar-restaurants. The *California Smokefree Indoor Workplace Law* now bans smoking in all workplaces including restaurants, bars and gaming clubs.[180]

## 5.1 San Luis Obispo Restaurants and Bars, California, 1993

One of the first systematic analyses of the economic impacts of anti-smoking ordinances on sales was conducted in San Luis Obispo, California, which, in August 1990, enacted one of the strictest ordinances in the U.S.A., banning smoking in all restaurants and bars in the city. Following the ban, a survey found 73.5% of City residents favoured the smoking ban, 23.5% were opposed; and 3% had no opinion.[181]

Sales tax analysis for the period April, 1985, to January, 1992, was conducted for the City by the Economic Forecast Project of the University of California at Santa Barbara. The study accounted for the effects of the general economic recession of the early 1990s by comparing San Luis Obispo restaurant and bar sales with those in other California jurisdictions that had not enacted anti-smoking ordinances. Additional patron and manager survey data were collected by the Taylor Consulting Group, a San Luis Obispo market research and public opinion polling firm.

The study concluded:

> *"The smoking ban appears to have no significant effects on the profitability of the restaurants and bars of San Luis Obispo. The ban has no measurable impact on restaurant and bar sales, as measured by sales tax revenues. This is true for both restaurants serving alcoholic beverages and those who do not. Furthermore, sales in neighbouring cities did not increase when the ban was instituted in San Luis Obispo."*[182]

The study also found no significant impact on tourism. The sales tax data were confirmed by a survey of 227 restaurant and bar patrons, which indicated that non-smokers were more likely to frequent restaurants and bars (16%) and smokers were less likely to do so (12%). As well, smokers were more often going to out-of-town establishments, while non-smokers were more likely to go to San Luis Obispo establishments. Overall, the study found, *"these two shifts offset one another such that there is no net sales impact."*[183]

A separate survey of restaurant and bar managers reported no significant cost savings or cost increases as a result of the ordinance, although some managers reported more employee smoke

breaks, while others reported reduced costs for drapery and carpet cleaning. Overall, the study concluded, *"these cost impacts are not experienced widely enough to represent a measurable impact on the collective bottom line of San Luis Obispo restaurants and bars."*[184]

The results can be considered robust in that the study meets important methodological criteria outlined in the previous chapter. Sales tax data are analyzed over a long enough time frame to eliminate seasonal fluctuations; the effects of the business cycle are accounted for; some wider business costs and benefits are considered; and objective sales tax data are supplemented by both patron and manager surveys.

## 5.2 Restaurants and Bars, California and Colorado, 1992, 1994, and 1997

The most comprehensive analyses of sales tax data to date have been conducted by the Institute for Health Policy Studies in the Department of Medicine at the University of California in San Francisco. Three studies, in 1992, 1994 and 1997 successively updated the data to assess changes over time.[185] Sales tax data for 1986-1996 were supplied by the Research and Statistics Division of the California Board of Equalization and analyzed by the researchers using multiple regression.

The 1994 study compared restaurant sales in 15 California and Colorado cities with smoke-free ordinances with 15 demographically comparable cities that had not enacted ordinances, using sales data for 1986-1993. The study further accounted for business cycle fluctuations by examining restaurant sales as a fraction of total retail sales.

The 1997 study replicated the earlier one, adding three more years of data. The long time frame for the sales tax data analysis (11 years) accounts not only for seasonal and business cycle fluctuations, but tests the earlier results and allows long-term trends to be assessed with considerable accuracy.

All California bars have been smoke-free since January 1, 1998, but the 1997 analysis also examined sales tax data in five California cities and two counties that had previously enacted their own prohibitions on smoking in bars between 1990 and 1994. Sales tax data for the two counties were available from 1986-1996, and for the five cities from 1991-1996. At the time of the study, the bar ordinances had been in effect for between 25 and 65 months, allowing long-term impacts on sales to be assessed for bars as well as restaurants.

Both the 1994 and 1997 studies found the same results and came to exactly the same conclusion:

> *"Smoke-free ordinances do not adversely affect either restaurant or bar sales.... Ordinances had no significant effect on the fraction of total retail sales that went to eating and drinking places or on the ratio between sales in communities with ordinances and sales in comparison communities. Ordinances requiring smoke-free bars had no significant effect on the fraction of revenues going to eating and drinking places that serve all types of liquor....*

*Legislators and government officials can enact health and safety regulations to protect patrons and employees in restaurants and bars from the toxins in secondhand tobacco smoke without fear of adverse economic consequences."*[186]

Citing California bar revenue data, an analysis published in *Tobacco Control* last year concluded that *"these data further discredit tobacco industry claims that smoke-free bar laws are bad for the bar business. Quite the contrary, these laws appear to be good for business."*[187]

These University of California studies were particularly significant because they explicitly tested undocumented claims by the tobacco industry and by tobacco industry-sponsored organizations that the first 100% smoke-free restaurant ordinances in California had produced a 30% drop in business.

Those organizations, including the Beverly Hills Restaurant Association (BHRA) and the California Business and Restaurant Alliance, were funded by the tobacco industry and created specifically to mobilize restaurants against smoke-free ordinances. According to the then-president of the BHRA, there was no Beverly Hills Restaurant Association before the smoke-free ordinance. He later testified that the organization had been set up by the tobacco industry for the specific purpose of fighting the legislation, and that the tobacco industry helped pay the organization's bills in a lawsuit against Beverly Hills.[188]

The tactics succeeded. Repeatedly using the undocumented allegation that business had suffered a 30% decline in revenues during the five months the smoke-free ordinance was in effect, the BHRA succeeded in having the Beverly Hills ordinance repealed in 1997. The same unsubstantiated argument succeeded in having the Bellflower anti-smoking ordinance repealed in 1992, and it has been frequently used by the Ontario Restaurant Association to oppose smoke-free by-laws in that province.[189]

The 1994 University of California study, using California State Board of Equalization sales tax data, included Beverly Hills and Bellflower in its analysis. The sales tax data demonstrated clearly that the undocumented tobacco industry arguments were false and, in the case of Bellflower, actually the *reverse* of what was claimed:

1) In Beverly Hills, *no* drop in restaurant sales occurred following enactment of the ordinance, let alone the 30% drop claimed by the tobacco industry and its front organizations. In fact, there was a slight increase in restaurant sales during the five months the by-law was in effect.
2) When Beverly Hills repealed its ordinance four months after enactment, *no* increase in restaurant sales occurred following repeal. In fact neither the ordinance nor its repeal had any measurable impact on sales at all.
3) Although the Bellflower ordinance was repealed in 1992 because of claims that business had dropped, sales tax data demonstrated that the smoke-free ordinance was actually associated with a marginally significant *increase* in restaurant sales.
4) After the Bellflower smoke-free ordinance was repealed, restaurant sales dropped.[190]

Had the tobacco industry and "restaurant association" argument been true, an increase in sales would be expected following repeal of both ordinances. The hard evidence indicates that tobacco

industry and associated claims have deliberately misled policy makers in the past, and that Nova Scotia legislators should be highly suspicious of unsubstantiated claims that a workplace smoke ban will hurt business.

Since 1998, statewide California legislation has banned smoking in all workplaces including restaurants, bars and gaming clubs, so that local ordinances in that state are no longer the primary battle grounds in the tobacco industry's efforts to resist restrictions on second-hand smoke. Indeed, the California experience demonstrates the greater utility and efficiency of statewide legislation in avoiding costly local struggles.

## 5.3 Restaurants, California, 1994

A detailed 1994 study conducted by the Claremont Institute for Economic Policy Studies at the Claremont Graduate School tested the impact of smoke-free ordinances on restaurant sales within a framework designed to account for a wide range of *other* non-ordinance local and statewide economic determinants of restaurant revenue.[191] One specific study goal was to test the results of the 1994 Glantz and Smith investigation (5.2 above) by using a different econometric model, considering a much larger sample of cities, and accounting for possible confounding variables.

California State Board of Equalization restaurant taxable sales data from 1986 to 1992 were collected for 106 California cities ranging from those with complete smoke bans to those with stronger and weaker restrictions (60%-80% non-smoking, and 50% non-smoking seating respectively), to those with no restrictions. In addition, a random sample survey of 4,644 adults in eight California cities was conducted to assess public support for no-smoking policies in restaurants and other workplaces.

This survey design is particularly strong because it controls for a wide range of other economic determinants, including:

1) taxable restaurant sales in the quarter prior to enactment of smoke-free ordinances as measure of past economic performance of the local restaurant industry;
2) total citywide non-restaurant taxable sales as a measure of local economic activity;
3) the number of restaurants in each city as a measure of the restaurant industry size;
4) city population as a measure of the clientele base of restaurants;
5) county unemployment rates and statewide personal income as general economic indicators.

The study also tested for any evidence of shifts in restaurant patronage from cities with smoking restrictions to surrounding cities without such restrictions.

But perhaps the most important contribution of this study is its capacity to compare smoking restrictions of various strengths. In response to the proposed Nova Scotia workplace legislation, Mr. Luc Erjavec of the Canadian Restaurant and Food Services Association said "he thinks a compromise can be worked out."[192] Indeed, this is in line with past tobacco industry efforts to weaken legislation and resist total smoking bans. The Claremont Institute results confirmed the Glantz and Smith conclusions:

- *"The study found ordinances had no systematic impact on restaurant revenues, regardless of the percentage of no-smoking seating required.*
- *Surrounding cities without ordinance restrictions exhibited patterns of effects that were indistinguishable from those of ordinance cities...."*[193]

Complete smoke bans, which are the only way to eliminate ETS from the work environment, did not impact restaurant sales any differently than weaker restrictions. This is supported by the associated survey results, which indicated that 81% of all respondents (and even 35% of smokers) supported a complete ban on smoking in restaurants.[194]

## 5.4 Restaurants, West Lake Hills, Texas, 1995

The previous studies were conducted by independent researchers. But a similar 1995 study in Texas was conducted by the Centers for Disease Control and Prevention (CDC) of the National Center for Chronic Disease Prevention and Health Promotion of the U.S. Department of Health and Human Services . The study, assessing the impact of a 100% smoke-free ordinance on restaurant sales in West Lake Hills, Texas, included all restaurants and restaurants with bar areas. Results were published first in the CDC's *Morbidity and Mortality Weekly Report,* and subsequently in the *Journal of the American Medical Association.*[195]

The significance of this study is that it carries the "official" imprimatur of the lead U.S. government agency in the field of public health, and that it takes particular care to establish the highest standards of methodological integrity. Indeed, its stated purpose is to assess the economic impact of smoke-free ordinances *"based on the most objective, scientific evidence available,"* and to provide *"a model for other local and state public agencies to consider when evaluating tobacco control programs."*[196]

The study is the methodological "state of the art" on this subject, and it contrasts its approach with reports of harm to business based on "anecdotal information," "restaurant owners' self-reports," and short-term tax data analyses that collect data for only one or two quarters following ordinance enactment.

By contrast the West Lake Hills study used sales data validated by tax revenue reported by the Texas State Comptroller's office for the 17-month period prior to ordinance implementation and the 19-month period following implementation. The model employs multiple linear regression techniques to account for seasonal variations in sales and temporal economic trends.

The study found that *"the total sales of the restaurants did not decrease after implementation of the ordinance."*[197] Perhaps even more significantly, the CDC's editorial board confirmed the earlier findings described in Sections 5.1, 5.2 and 5.3 above and the methodologies on which those studies were based:

> *"The findings in this report are consistent with assessments using similar methods in other locations that have reported that the implementation of smoke-free*

*ordinances has not been associated with adverse economic effects on restaurants."*[198]

## 5.5 Restaurants and Bars, Massachusetts, 1997 and 2000

A 1997 study conducted by the Center for Health Economics Research for the Massachusetts Department of Public Health was the first to attempt a comprehensive analysis of the economic impact of smoke-free restaurant ordinances in an entire U.S. state.[199] These results are therefore of particular interest to Nova Scotia lawmakers, as they are considering legislation for the province as a whole, as opposed to municipal councils that govern smaller jurisdictions.

The Massachusetts study allowed the first systematic state-wide comparison of towns that adopted highly restrictive policies with those that adopted weak restrictions or none at all. Highly restrictive ordinances were classified as those that either completely eliminated smoking in restaurants, or that confined smoking entirely to separate, enclosed, and separately ventilated sections. Weak restrictions are defined as those designating a percentage of seats non-smoking.

The researchers identified the smoking status of Massachusetts' towns and cities representing 98% of the state's population. The only jurisdictions omitted from the study were those that had not reported their smoking status, that did not have complete sales tax records available for the period under consideration, or that had fewer than 10 restaurants, and where confidentiality required the Massachusetts Department of Revenue to suppress data.

Inflation-adjusted taxable meal receipts data from the Department of Revenue were analyzed for 31 cities and towns that adopted highly restrictive smoke-free ordinances within a four-year time span from January 1992 through December, 1995, and for 222 control communities that had weak or non-existent restrictions. Data were analyzed for the six months immediately following adoption of a smoking ban, and for the same six-month period one year earlier, in order to control for seasonal fluctuations. Results were as follows:

> *"For the experimental communities as a whole [those adopting highly restrictive smoke-free ordinances], inflation-adjusted restaurant receipts were 5 percent greater in the six months following imposition of a smoke-free policy than in the same six months one year earlier, pre-ban. In contrast, there was virtually no change in sales in control communities that did not adopt smoke-free restrictions. The comparison of experimental and control communities indicates that adoption of highly-restrictive restaurant smoking policies led to an increase of about 5 percent in restaurant receipts in the six months following the imposition of the ban."*[200]

These results are based on raw aggregate receipts data. The researchers then used multivariate analysis to estimate the average effect of smoke-free policies, controlling for seasonal and year effects, general economic trends, data collection methods, and other factors that vary over time across all towns. By removing the influence of these other factors, it is possible to obtain an

unbiased estimate of the particular effect of smoking restrictions on restaurant sales. Three different regression models were used to assess whether results were consistent:

> *"All models indicate that smoke-free restaurant restrictions increased restaurant receipts in towns adopting smoke-free policies, by 5 to 9 percent. This is consistent with the descriptive results. The range of uncertainty of the estimates is 0-12 percent, indicating that the measured positive effect of smoking restrictions is unlikely to be due to random fluctuations (noise in the data). There is no support for the hypothesis that restaurant smoking restrictions reduced restaurant receipts."*[201]

A separate study of aggregate meal tax receipts in Brookline, Massachusetts, confirmed these results and found that a smoke-free policy for all city restaurants and bars "*did not have a significant, immediate effect on the city's restaurant patronage.*"[202]

### *5.5.1 Massachusetts: Refinements in the 2000 Study Update*

These data, results and conclusions were updated and confirmed by the authors in a November, 2000final report submitted to the Massachusetts Department of Public Health.[203] The update, which analyzed three additional years of data (through 1998), was necessary because the profile of Massachusetts cities and towns with smoke-free ordinances has changed dramatically in recent years.

By April, 1999, 153 cities and towns, representing two-thirds of the state's population, had restricted smoking in restaurants, including 75 which either completely prohibit smoking in restaurants, or impose severe restrictions such as requiring separate, enclosed and separately ventilated smoking rooms. The update therefore allowed analysis of a considerably larger group of communities with smoke-free legislation over a longer period of time.

In addition, the update separately analyzed alcohol-serving establishments, including restaurants, bar sections of restaurants, and free-standing bars, the most comprehensive sales tax study to do so systematically. These results are particularly interesting because smoke-free policies have been assumed to affect alcohol-serving establishments disproportionately because of the apparent correlation between the consumption of alcohol and tobacco.

Because the Massachusetts Department of Revenue does not release data for communities with fewer than 10 restaurants in order to protect confidentiality, and because there are fewer communities with at least 10 alcohol-serving establishments, the alcohol-serving analysis included data from 79 communities, compared to 239 for the full restaurant analysis.

Given the 10-restaurant minimum, the full analysis included 60 Massachusetts cities and towns that had adopted highly restrictive smoking policies between January 1992 and December 1998, and 179 communities that either had no restrictions or weak ones simply designating a portion of seats as non-smoking. For alcohol-serving establishments, the study analyzed 22 communities with strong restrictions and 57 without such restrictions.

The update also went beyond the earlier 1997 study by analyzing trends in highly restrictive towns that were surrounded by communities without smoking restrictions, compared to highly restrictive towns surrounded by other highly restrictive towns. This additional variable was designed to test whether smokers might migrate to communities with less restrictive policies, thus adversely affecting restaurant sales in the highly restrictive communities.

The analysis found that per capita meals receipts for alcohol-serving establishments in communities with strong smoking restrictions grew between 1992 and 1998 at almost twice the rate of those in communities without such restrictions. For all restaurants, there was no significant difference in the trend lines, though towns with strong smoking restrictions saw a somewhat faster rate of growth in sales than towns without such restrictions.[204]

Regression analyses controlling for a range of seasonal, income and other economic variables and for the extent of smoking restriction were conducted to assess the degree to which these trends could be attributed to smoke-free policies.

The sample size was also large enough to conduct a sensitivity analysis that separated out, from the 60 communities with highly restrictive policies, twelve that may not have completely eliminated the presence of second-hand smoke from non-smoking sections. It was therefore possible to test whether a complete prohibition of smoking in restaurants, including bar sections of restaurants, had a different economic impact than allowing smoking in bar sections only with a buffer zone.

The results of all analyses confirmed the conclusions of the 1997 study:

> *"Our findings indicate that highly restrictive restaurant smoking policies do not have a statistically significant effect on a community's level of meals receipts. Controlling for other less restrictive restaurant smoking policies did not change our findings. Similarly, analyzing data for only those establishments that served alcoholic beverages generated a similar set of results.*
>
> *While restaurants in Massachusetts experienced an overall increase in revenue between 1992 and 1998, the local adoption of restaurant smoking policies did not lead to a measurable deviation from this strong positive trend.... Results of our sensitivity analysis were consistent with our main findings. Across all models, the implementation of a highly restrictive restaurant smoking policy did not have a significant effect on restaurant sales."*[205]

The authors speculate that a reason for the null finding may be that smokers are not sufficiently inconvenienced by smoke-free policies to alter their demand for restaurant meals substantially, or that non-smokers may increase their demand for restaurant meals, thus offsetting any reduction in sales among smokers. These hypotheses will be tested in survey material presented in the next chapter.

The 2000 Massachusetts study also found that towns that were completely surrounded by other towns with highly restrictive restaurant smoking policies had an average of 7.9% higher monthly

per capita restaurant sales than those surrounded by towns without highly restrictive policies. However, regression analysis controlling for economic, seasonal and other variables found that the portion of border towns with or without highly restrictive policies *"failed to have a statistically significant effect on meals receipts (among all establishments and the subset of alcohol-serving places)."*[206]

For Nova Scotia legislators considering province-wide restrictions, any border effect can therefore be dismissed, even for communities on the New Brunswick border. There is clearly no economic need to wait for neighbouring provinces to adopt similar legislation.

## 5.6. Restaurants, Hotels and Motels, Arizona, 1998

In June, 1993, Flagstaff became the first city in Arizona to prohibit smoking. This provided an excellent opportunity to compare the economic impact of the ban with six different no-intervention comparison areas in Arizona at the city, county and state levels. Following the methods and procedures in the studies described above, taxable restaurant sales and total retail sales data were collected for a five year period, from 3.5 years prior to enactment of the smoke-free ordinance in Flagstaff to 1.5 years afterwards.[207]

The results are significant for Nova Scotia because this is the first published study to use the same methods validated by the U.S. Centers for Disease Control (5.4 above) to include tourism impacts explicitly, and to assess the impact of a smoke-free ordinance on hotel and motel sales. Flagstaff, like Nova Scotia, is a primary tourist destination, and depends largely on tourism for its economic prosperity.

Account was taken of population size and increase, tourism impacts, and overall economic trends. For all seven comparisons, four separate analyses were conducted:

1) comparison of restaurant sales before and after enactment of the no-smoking ordinance;
2) comparison of ratios of Flagstaff restaurant sales to comparison areas before and after enactment of the ordinance;
3) comparison of ratios of Flagstaff restaurant sales to Flagstaff retails sales before and after enactment of the ordinance;
4) comparison of motel/hotel sales before and after enactment of the no-smoking ordinance.

> *"All analyses resulted in the same conclusions: prohibiting smoking in restaurants did not affect restaurant sales....If prohibiting smoking in restaurants had a negative effect on restaurant sales, one would expect that at least one of the analyses would show a significant difference. However, none of the analyses conducted found that the ordinance had either a positive or a negative effect on restaurant sales.... Since businesses are legally required to report accurate data, the investigators knew of no other way to collect more accurate data."* [208]

No significant changes in trends were found in the comparison of motel and hotel sales, indicating that the no-smoking prohibition had no discernible impact on tourism. The researchers

explicitly confirmed the previous studies and findings described in sections 5.1, 5.2, 5.3 and 5.4 above, that *"smoke-free ordinances did not adversely affect restaurant sales."*[209]

The authors also compared their results with an earlier voluntary Flagstaff by-law, in order to assess a standard tobacco industry argument that restaurants and bars should be given a choice of whether to allow or prohibit smoking. Given the choice, that analysis found that 82% of restaurateurs chose to allow smoking. The researchers concluded that voluntary policies are *"unlikely to prevent exposure of restaurant patrons and employees to environmental tobacco smoke."*[210]

Based on the accumulated evidence and the consistency of results, the Northern Arizona University researchers provide direct advice to other communities:

> *"The accumulating evidence associating passive smoking with health risks indicates a need for stronger efforts to protect nonsmokers from exposure to tobacco smoke.... Local governments contemplating the adoption of smoke-free legislation should note that this study found that prohibiting smoking in city restaurants had no effect on restaurant sales.... If these [and other] findings are true for communities throughout the United States, then other cities can enact similar laws, which protect restaurant patrons and food service workers from tobacco smoke, without concerns that restaurants will lose business."*[211]

## 5.7 Restaurants and Hotels, New York City, 1999

In April, 1995, New York City's Smoke-Free Air Act prohibited smoking in the indoor dining area of restaurants with more than 35 seats and in most other indoor public places. Research scientists analyzed taxable sales data for eating and drinking establishments, hotels, and the retail trade for each county in New York State from March 1990 to February 1997 in order to determine the economic impact of the legislation on the city's restaurant and hotel industries.[212] Data were obtained from the New York State Department of Taxation and Finance.

The study combines the strengths of several earlier studies. The analysis of data for all 62 counties in the state shares the comprehensiveness of the Massachusetts study (5.5 above), and allows a comparison of sales trends in the five smoke-free New York City counties with the 55 state counties that had no smoke-free restaurant law.[213] Like the Flagstaff study (5.6 above), the researchers included taxable sales data from hotels as well as restaurants, but were able for the first time to analyze comparative hotel sales data on a state-wide basis.

As in earlier studies, the total retail sales data and the long (seven-year) time span of the data set account for seasonal, business cycle and other economic fluctuations. All values are adjusted for inflation. A multivariate linear regression of each of five outcome measures further controlled for time, season and unemployment rates. As before, the inclusion of hotel data, and the state-wide analysis have particular relevance for Nova Scotia legislators who are considering province-wide legislation and who must account for tourism impacts.

The results for each of the five outcome measures are as follows:

- Compared with levels two years earlier, real taxable sales from eating and drinking establishments increased by 2.1% in New York City after the Smoke-Free Air Act took effect and decreased by 3.8% in the rest of the state, where smoke-free ordinances were not in effect.

- Real taxable sales from hotels increased sharply by 36.9% in New York City after the Act, and by 2.4% in the rest of the state. Both New York City and New York State hotel sales in the two years prior to the Act had been almost flat.

- The ratio of taxable restaurant sales to total retail sales in New York City remained nearly constant over time at about 24%.

- The ratio of taxable restaurant sales in New York City to taxable restaurant sales in the rest of the state increased from 86% to more than 100%.

- The ratio of hotel revenue in New York City to hotel revenue in the rest of the state doubled from about 120% to 240%.

- The multivariate linear regression for each of these five outcome measures confirmed that the smoke-free ordinance was not significantly associated with sales for eating and drinking establishments or hotels, regardless of the outcome measure used.

> *"Based on these data, it can be concluded that the smoke-free law did not harm the restaurant industry in New York City. Further, no evidence was found that the hotel industry has been adversely affected by the smoke-free legislation.... Based on the findings from this study and the weight of evidence from the literature, the authors conclude the smoke-free law was not detrimental to the restaurant or hotel industries in New York City."*[214]

Other data sources on industry health confirm the findings based on sales tax data, and reveal no evidence that the Smoke-Free Air Act had any adverse economic impacts:

- Restaurant openings far outpaced restaurant closings in 1995, 1996 and 1997.
- Restaurant employment increased by 18% between 1993 and 1997, with 19,347 jobs added, compared to only a 5% increase in the rest of New York State where smoke-free ordinances did not exist.[215]
- The 1996 Zagat NYC Restaurant Survey, a standard hospitality industry survey covering over 1,800 restaurants, reported that eating out was up 22% from the previous year and the highest weekly pace recorded in over a decade.[216]
- Per meal spending was also up 1.5% in 1996, and inflation-adjusted per-meal restaurant spending remained relatively constant from 1995 to 1997.
- New York City hotel occupancy rates increased from 78.5% in 1995 to 81% in 1997.
- New York City tourism spending in 1997 was $500 million more than the previous year.
- A survey of New York City restaurant owners and managers found that small restaurants and bars exempted from the smoke-free law reported similar sales trends compared with places affected by the law.[217]

Just as Glantz and Smith used sales tax data to disprove unsubstantiated tobacco industry claims of a drop in restaurant sales in California, which led the cities of Beverly Hills and Bellflower to repeal smoke-free legislation (5.2 above), so this New York study disproved similar undocumented claims in that state.

A New York organization called the Empire State Tavern and Restaurant Association produced a study alleging a loss of jobs following implementation of New York City's smoke-free legislation. Further investigation showed that the alleged job losses in fact occurred *before* the New York City ordinance was implemented.[218]

The proliferation of such unsupported claims by the tobacco industry and affiliated organizations in their efforts to influence policy makers, indicates the vital importance of these objective and verifiable studies based on official sales tax data. In this case the provision of accurate and comprehensive information to lawmakers can literally save hundreds of lives in Nova Scotia.

## 5.8 Tourism and Hotel Revenues in 6 U.S. States, 1999

As noted above, the tobacco industry and its affiliated organizations have frequently claimed that smoke-free ordinances would adversely affect tourism and hotel sales, and would discourage conventions. Europeans, in particular, are said to want their smoking rights.

For example, a tobacco industry front group called the United Restaurant, Hotel, Tavern Association of New York (URHTA) warned the city in 1994: *"New York stands to lose millions of dollars as meetings and conventions that bring visitors from all over the world take their business and vacations elsewhere."*[219] It later emerged the URHTA was funded by the tobacco industry and had no active chapter in New York City. As noted above (5.7), New York City hotels experienced a tourism boom following the Smoke-Free Air Act, with sharply increased sales and occupancy rates.

No documentation has been offered for these tobacco industry assertions. Because of the importance of tourism for the Nova Scotia economy, however, this claim is worth particularly thorough investigation.

The Flagstaff and New York studies (5.5 and 5.6 above) were the first to test these unsubstantiated claims in particular locales. The first found no impact on tourism or hotel/motel sales; the second found a substantial increase in hotel sales following the smoke-free law. In 1998, The Institute for Health Policy Studies in the Department of Medicine at the University of California, San Francisco, systematically tested the tobacco industry assertions in every jurisdiction in the United States where the claim of adverse effects on tourism had been made.[220]

The researchers found three states (California, Utah and Vermont) and 6 cities (Boulder, Colorado; Flagstaff and Mesa, Arizona; New York, NY; and San Francisco and Los Angeles, California) in the USA where the effect on tourism of 100% smoke-free restaurant ordinances had been debated. This is the only study that focuses comprehensively and systematically on

tourism impacts alone, and which covers a wide range of geographic locations and different types of tourist destinations.

As noted in the methodological observations in chapter 4 above, a valid study will account for underlying economic conditions, inflation, and the overall health of the tourism industry. This is accomplished in the University of California study by using constant 1997 dollars to analyze hotel and hotel room revenues in the study localities before and after ordinance enactment both as a fraction of total retail sales, and also by comparison with hotel revenues for the entire United States. Tourism flows from Europe and Japan were also analyzed. Official sales tax, tourism, national accounts and consumer price index data were used as sources.[221]

The study found that, taken together, "*the ordinances had no significant effect, one way or the other, on tourist revenues as a fraction of total retail sales or compared with the rate of change in the United States as a whole.... International tourism was either unaffected or increased following implementation of the smoke-free ordinances.*"[222]

Analyzed separately, the results showed a significant increase in the rate of change of hotel revenues following smoke-free legislation in four out of the nine localities, no significant change in four localities, and a slowing in the rate of increase (but not a decrease) in only one locality. The authors concluded:

> *"This study debunks the tobacco industry allegation that smoke-free restaurant laws adversely affect tourism, including international tourism.... Contrary to industry claims, these ordinances were not associated with significant drops in tourism. Quite the contrary, in several locales the ordinances were associated with significant increases in tourism.... Smoke-free restaurant ordinances did not hurt, and may have helped, international tourism....*
>
> *Food-service workers enjoy the least protection from secondhand smoke of any employee group. Legislators and government officials can enact such health and safety requirements to protect patrons and employees in restaurants from the toxins in secondhand tobacco smoke without the fear of adverse effects on tourism. Indeed, these ordinances may even be beneficial for business.*"[223]

## 5.9 Conclusions of All Studies

One other study has been found that analyzes long-term sales tax data, interestingly enough from the leading tobacco-producing state in the U.S. The study examined restaurant sales data from 1990 to 1997 for 10 counties in North Carolina to assess whether no-smoking regulations in some counties had adversely affected restaurant sales.[224]

The study found that the 10 counties experienced similar sales patterns and found no statistically significant impacts due to smoke-free ordinances. The researchers concluded that smoking restrictions and smoke-free ordinances do not affect restaurant sales and have no adverse impact on restaurant business.

The studies cited above are, as far as the author can determine, a complete listing of all published studies that use objective sales tax data to assess the longer-term economic impacts of smoke-free ordinances on restaurant, bar and hotel sales. The studies span a decade and a wide range of geographical locations in eight different U.S. states. They use a broad range of controls that account for seasonal, employment, and business cycle fluctuations. There is no selectivity or bias either in the choice of studies examined or in the data selection methods of the studies themselves.

Without exception, *all* the studies come to the same unequivocal conclusion: Smoke-free legislation has no adverse impact on business. Some studies find that smoke bans may possibly have a positive impact, but none find evidence of any negative impact. It is therefore proven beyond any reasonable doubt that smoking bans do not adversely affect aggregate restaurant, bar and hotel sales. Indeed, the probability that every published study analyzing verifiable sales tax receipts could be wrong is close to zero.

Other recent surveys of the available evidence come to the same conclusion:

> *"All the empirical evidence supports the proposition that smoke-free restaurant ordinances do not hurt the restaurant business."*[225]

> *"The conclusion of **all** published studies that used tax data in the analysis is that smoking restrictions do not impact negatively on hospitality sales and/or on employment nor on tourism activity in the long run.... The results generally are unequivocal in that the statistics indicate no negative impact on the proportion of consumer spending in restaurants."*[226]

Another comprehensive review of the evidence concurs:

> *"In one study after another, covering multiple states within the US, analysts have found no adverse effect of smoking restrictions, including complete bans, on local restaurants' business. Indeed, several of the studies have found a tendency for smoking restrictions to increase business. Similar findings derive from analysis of the effects of smoking restrictions on bars (presumed the smoker's sacred territory) and of the impacts of restaurant and bar restrictions on tourism."*[227]

The analysis notes that industry challenges to these data *"have never themselves involved empirical analysis of objective experience."*[228]

Nevertheless, a caveat must be added here. All the above studies review *aggregate* sales tax data over a reasonably long time period, and may therefore conceal short-term changes and differential trends among different types of restaurants. In order to investigate these possibilities, the following chapter briefly reviews a range of other studies on the economic impact of smoke-free legislation, including patron surveys, that are helpful in disaggregating some of the results cited above, and providing more detail on trends within the restaurant industry itself.

## 5.10 Predicted Impacts on Nova Scotia Tourism Flows

Many of the dire predicted impacts of a smoking ban relate to tourism flows from Asia and Europe. For example, the Tourism Industry Association of Nova Scotia has stated:

> *"...the population of many of our growing tourism target markets (Asia and Europe) are smokers. There needs to be a balance between health concerns and the impact on business."*[229]

The president of the Hotel Association of Canada, which received $3.2 million from the Canadian Tobacco Manufacturers' Council to operate its "Courtesy of Choice" campaign,[230] stated in Halifax that many tourists, particularly those from Europe and Asia, will not come to a place where they cannot smoke:

> *"By the year 2005, two-thirds of all global travel will emanate from Asia. People there smoke a lot. If they can't do something they do every day, then immediately we're putting up another barrier."*[231]

However, the *actual* tourism flows to Nova Scotia do not support these predictions. In 1998, 80% of visitors to Nova Scotia were from other parts of Canada, an increase of 10% from the previous year. American visitors accounted for 18%, an increase of 7%. Overseas visitors accounted for only 2.8% of visitors, a decline of 5% from the previous year. More than 80% of this small pool of overseas visitors were from Europe. Asian and all other overseas visitors combined accounted for only 0.4% of visitors to Nova Scotia.[232]

A Philip Morris Incorporated survey of 1,000 smokers in each of 10 European countries found that smokers in every one of these countries were *more* accepting of smoke-free regulations than Americans, with most continuing to eat out just as frequently when smoke-free restaurant ordinances were in effect.[233] Furthermore, 22% of visitors to Nova Scotia come from Ontario and a further 7% are from the New England states, and are well accustomed to smoke-free restrictions in their own jurisdictions.

Given actual tourism flows and tourist behaviour patterns, combined with the evidence in this chapter that smoke-free legislation in the U.S. has no adverse impact on hotel sales and tourism revenues, there is, therefore, no empirical support for the prediction that a smoke ban will harm tourism in Nova Scotia.

Indeed, none of those predictions has assessed the likely *increase* in hospitality industry patronage by the vast majority of non-smoking tourists, many of whom consciously avoid smoky places. Survey evidence on that subject is assessed in the next chapter. But one response to the TIANS survey on smoke-free legislation is worth noting here: *"Why not take the high road and promote NS as a healthy, trend-setting, visionary, smoke-free environment – a marketing opportunity for the new century and new generation of visitors?"*[234]

## 6. Other Economic Impact Studies

Two other studies were found that use sales tax data to examine (a) short-term trends for the first 2-3 months following smoke-free legislation, and (b) certain *types* of sales. In addition, patron survey data has assessed trends *within* the restaurant industry that may result from smoke-free legislation, and that can provide important marketing information to restaurateurs on how they may adapt to a changing client base.

None of those studies invalidate the clear conclusion that smoke-free legislation has no overall adverse impact on business. But they do provide a level of detail that the aggregate long-term sales data cannot provide, and they can help facilitate the transition to smoke-free workplaces that better protect the health of employees and patrons alike and assist owners and managers in making market adjustments.

### 6.1 Short Term Sales: Mesa, Arizona, (1996) and British Columbia (2001)

A preliminary analysis of the short-term impacts of smoke-free legislation on selected businesses in Mesa, Arizona, was conducted in 1996 for the two months following enactment of the ordinance. The investigators found that selected categories of restaurants experienced a 4% actual sales decrease (6% adjusted decrease) over the two-month period compared to sales data from the same two months in the previous year.[235]

The investigators noted that two months was not an adequate length of time to make a judgement about the sales impact of the smoke-free ordinance, and that further study of longer-term data was required. Glantz and Charlesworth's longer-term analysis of tourism and hotel revenues (5.8 above) found that Mesa's smoke-free ordinance had no adverse impacts on hotel sales in Mesa, either in total revenues, as a fraction of total retail sales, or as fraction of national hotel revenues.[236]

In 1998, the Workers' Compensation Board (WCB) in British Columbia banned smoking in most workplaces, and provided protection from ETS exposure to 85% of B.C. workers. The rules were implemented with little problem and widely respected.

On January 1, 2000, the WCB extended its workplace smoking restrictions to include all hospitality and public entertainment facilities in the province, including all restaurants, bars, cabarets, games rooms, sporting arenas and bingo halls. The rationale was that the WCB is responsible for the occupational health and safety of *all* workplaces, and that *all* workers are therefore entitled to protection from environmental tobacco smoke regardless of their place of work.

That amendment was overturned by a judge on March 22, 2000, pending more public consultations. Those public consultations have now concluded and the WCB has reintroduced the regulations that will this year extend full protection from second-hand smoke to the remaining 15% of B.C. workers. The new amendments, which will ban smoking in all hospitality and entertainment facilities including bars and restaurants in the province, will come into effect April, 2002.

Pacific Analytics examined the impact of the smoking restrictions between January 1, 2000, and March 22, 2000, on liquor purchases only. Food sales, the dominant revenue source for restaurants, were not examined. The study frankly acknowledged that *"the behaviour of restaurant, cabaret and pub patrons in the short run could differ from their long-term behaviour,"* and that longer-term actions might result in a return to previous behaviour patterns.[237]

Pacific Analytics found that:

- Total January liquor purchases declined by 12.3%; February purchases declined by 4.9%; and March purchases increased by 8.2%;
- The WCB Amendment appeared to have a negative impact on hotel and pub alcohol purchases in January but not in February and March.
- Dining establishment liquor purchases declined 11.9% in January and 1.7% in February, but increased by 12.8% in March.
- Cabaret liquor purchases did not differ significantly in January and February, and increased by 11.3% in March.[238]

In sum, it appears that a complete ban on smoking in restaurants and bars reduces liquor sales in the first month after enactment, but that sales increase by the third month. These results are consistent with the short-term impacts observed in Mesa, Arizona.

These results are also logical, because a mandatory ban may *initially* discourage smokers from frequenting eating and drinking establishments, while voluntary changes of behaviour will take somewhat longer to manifest. Evidence presented below indicates that nonsmokers will begin frequenting restaurants and bars they previously avoided because of their smoky atmosphere and smokers will adjust to the new regulations. But that trend is likely to more gradual than the immediate impact of a mandatory prohibition.

What is remarkable in the B.C. study is how quickly the trends changed, with increases in liquor purchases recorded by the third month of the ban. If that increase is sustained over time as nonsmokers (the vast majority of the population) eat out more frequently, then the overall increase in sales may more than compensate for the very short-term temporary decline.

Again, it must be noted that the British Columbia study noted that the January 2000 decline in liquor purchases *"does not necessarily imply a decline in food sales, the dominant revenue source for Dining Establishments."*[239] In addition, it might be argued that, from a full-cost accounting perspective that includes road accident and other costs, a decline in liquor purchases, especially when consumed before driving, is not necessarily a negative phenomenon.

### *6.1.1 Longer Term Trends*

In order to assess longer term trends, Pacific Analytic compared its January-March trends with data from Victoria and the Capital Regional District (CRD), where a no-smoking ordinance has been in effect since January, 1999. Again, the study found a short-term negative impact on liquor

purchases after the by-law came into effect. However, the long-term impacts were neutral for all types of liquor:

> *"Hence, once can conclude that within the CRD there are no long-term impacts associated with the no-smoking bylaw.... The statistical results strongly confirm that there are no long-term impacts from restrictive smoking regulations."*[240]

These results are independently confirmed by the B.C. Liquor Distribution Branch. As reported by the *Vancouver Sun* just nine months after Victoria's anti-smoking legislation came into force:

> ***Victoria drinks up despite tough smoking law***
> *Pubs were supposed to close, patrons were supposed to stay home and booze sales were supposed to drop. But nine months after tough anti-smoking legislation was imposed in B.C.'s capital, business remains steady and liquor sales are up.... According to figures compiled by the Liquor Distribution Branch, booze sales at Victoria-area pubs, restaurants and hotels are up 1.7 per cent for the first nine months of the year over the same period last year.*[241]

The Pacific Analytics study further examined liquor sales in B.C. regions close to the Alberta and U.S. borders, in order to assess whether non-smoking regulations would impact competitiveness by prompting smokers to cross the border in order to dine and consume liquor. The study results indicated that:

> *"...there was no statistical difference in overall impacts as compared to the province as a whole. Consequently, we can say with confidence that being close to a border did not result in greater loss of business....The general conclusion is that the proposed amendment will not impact on BC's competitiveness in terms of customers frequenting out-of-province restaurants and bars."*[242]

A further regression equation for tourism in the Capital Regional District confirmed that:

> *"...long-run tourism activity in the CRD was not negatively affected by the introduction of the no-smoking bylaw. In conclusion, then, the statistics suggest that the introduction of the proposed amendment will cause neither a substantive dislocation of BC residents to drink and dine in Alberta and US facilities nor will there be an impact on tourist visits to BC."*[243]

The overall conclusion of the study is that non-smoking legislation would likely have some short-term negative impacts on liquor purchases, but that *"in the longer term, no measurable impact on either employment or sales would be likely."*[244]

Indeed, the actual results indicate that the short-term negative impacts on liquor sales are unlikely to exceed one month, and that third month liquor sales already show an increase over corresponding pre-ban sales. The adjustment period is, therefore, very short, and any initial slump is quickly compensated. No information is available on dining sales impacts in B.C.

Finally, the Pacific Analytic results imply by inference that no-smoking ordinances may result in shifts in the client base of eating and drinking establishments, including shifts in behaviour that may necessitate market adjustments. For example, by the third month after the WCB Amendment came into effect, wine sales showed the strongest increase in purchases, while beer sales lagged. This is consistent with a possible increase in nonsmokers dining out and ordering wine with their meal, and might necessitate a shift in ordering patterns for owners and managers.

However, such expected market adjustments have no effect on overall industry health. Instead, economic impact studies, such as the Pacific Analytic analysis and the survey data that follows, can provide useful market signals to restaurant and bar owners and managers that can help facilitate the clientele shifts that may occur following implementation of smoke-free legislation.

## 6.2 Patron Surveys and Consumer Behaviour

As noted in 5.9 above, it is proven beyond any reasonable doubt that smoking bans do not adversely affect aggregate restaurant, bar and hotel sales. Indeed, the probability that every published study analyzing verifiable sales tax receipts could be wrong is close to zero. Despite their strengths and their objectivity, however, these studies use aggregate data to assess overall business trends, but cannot reveal internal shifts in customer behaviour, nor changing sales patterns within the hospitality industry.

For that reason, any economic impact analysis of the effect of smoke-free legislation should supplement the sales tax studies with patron survey data that reveal changing customer preferences. This information can assist owners and managers in making market adjustments to adapt successfully to the smoke-free legislation, and to position themselves to take advantage of a potentially expanded client base among non-smokers.

For example, restaurant and bar owners will want to know the extent to which smokers are sufficiently inconvenienced by smoke-free legislation to alter their demand for restaurant meals and liquor, and the extent to which they adjust to the new regulations. They will also want to know the extent to which non-smokers increase their demand for restaurant meals, and the extent to which that increased demand may offset any reductions in sales among non-smokers. In addition, as the B.C. study implies (6.1 above), such shifting patterns may lead to subtle changes in *type* of consumer demand, including type of liquor consumed, and even establishment atmosphere.

A small number of reputable patron surveys have been found that assess changes in customer behaviour, and that can serve as reliable tests of the sales tax data results. The surveys are conducted either by industry sources or by respected academic researchers with funding sources that do not advocate a position; the validity of the research design, sample size and sample selection can be verified; and the results are not purely anecdotal.

### *6.2.1 A Note on Existing Owner/Manager Surveys*

By contrast, the same is not true for owner and manager surveys that have produced highly suspect results frequently quoted by the tobacco industry and its affiliates. For example, the U.S. National Smokers Alliance (NSA) sponsored a survey of New York City restaurant owners' reactions to the city's Smoke-Free Air Act one month after its enactment, and reported that 56.4% of owners reported an average 16% decline in sales which they blamed on the Act.

Even if owner perceptions are correct, (which longer-term objective sales tax data dispute), the inferred causal relationship between the Act and the supposed decline in sales is unproved.

- The alleged decline may be due to other factors, including seasonal and economic fluctuations.
- There may be selection bias in the restaurants sampled.
- The one-month time span since enactment is too short to assess impacts on business.
- And the impact of the Act is determined by consumer behaviour, not owner perceptions.

Commenting on the NSA survey, researchers at Cornell University's highly respected School of Hotel Administration note:

> *"Based on the incomplete information currently available, a reliable assessment of the degree to which the act or any other factor caused this alleged decline is impossible. Second, the NSA study was a survey of restaurant owners; it failed to report on New York City restaurant consumers, the population whose change in behavior is of primary interest. Any impact the act has on New York City restaurants comes as a result of changes in the dining behavior of New York's restaurant consumers. To estimate the impact of the act, one needed to study restaurant consumers, now owners and managers."*[245]

A very recent report (2001) to the Workers Compensation Board of British Columbia reviewed existing U.S. owner/manager surveys assessing the economic impacts of smoking restrictions, and concluded that their methodology was fundamentally flawed:

> *"First, even if the choice of businesses surveyed is truly random (which often is not the case), the results are often based on the perceptions of affected owners/managers rather than actual sales figures. While the owners/managers may not be intentionally biasing their responses, under such circumstances their answers may not reflect actual experience.*
>
> *More important, even if business activity did decline, there may be other, perfectly valid reasons that caused sales to decline. For example, visitor arrivals may be down. Alternatively, the overall level of economic activity in the jurisdiction may be declining resulting in higher unemployment and lower disposable income. In view of these problems, then, these studies generally have not achieved any real credibility in the literature."*[246]

This is in sharp contrast to the detailed regression analyses discussed in Chapter 5 above, which carefully control for seasonal, employment, income and other business cycle fluctuations. For all

the reasons given here, respected researchers have relied on validated patron survey results to assess likely consumer responses to smoke-free legislation.

### *6.2.1: The National Restaurant Association Survey*

One of the earliest attempts to assess potential customer response to smoke-free legislation was a national phone survey of 1,000 people conducted by ICR Survey Research Group for the U.S. National Restaurant Association in January, 1993. The survey asked about attitudes and likely behaviour if such legislation were enacted where respondents live. A majority of respondents indicated that they supported smoking prohibitions and would be *more* likely to patronize a restaurant that banned smoking, while fewer indicated that they would be less likely to go to a restaurant that banned smoking.[247]

The study made no attempt to assess the actual impact of smoke-free legislation on either restaurateurs or customers, and was undertaken prior to most smoke-free legislation in the U.S., including New York City's Smoke-Free Air Act and state-wide legislation in California. The results may also reflect consistent public opinion polls in favour of smoke-free legislation, and the fact that the vast majority of adults are non-smokers, rather than representing an accurate guide to actual consumer behaviour.

### *6.2.2 Cornell Survey of New York City Patrons*

In 1995-96, the Cornell Center for Hospitality Research funded a study by a Cornell University School of Hotel Administration professor of management, Dr. Cathy Enz, and two doctoral candidates, David Corsun and Cheri Young, to assess the actual impact of New York City's Smoke-Free Air Act on consumer behaviour. Dr. Steven Schwager of Cornell University, assisted in designing the sampling strategy. Their work, published in the *Cornell Hotel and Restaurant Administration Quarterly,* is the first published research to examine consumer response to smoke-free restaurant laws.[248]

The Smoke-Free Air Act of April, 1995, as noted above, banned smoking entirely in New York City restaurants with more than 35 indoor seats. In August, 1995, four months after the Act came into effect, the Cornell University researchers asked 389 patrons of New York City restaurants, including 134 smokers and 255 non-smokers how their dining behaviour had changed as a result of the Act.

Of the smokers, 37.6% said they were dining out less frequently, and 5.3% reported they were dining out more frequently. Of the non-smokers, 16.5% reported dining out more frequently, and only 1.9% reported dining out less frequently. However, smokers account for less than 30% of weekly restaurant spending, and nonsmokers for more than 70%. Combining the statistics, *"our results indicate that these nonsmokers are more than making up the revenues lost from inconvenienced diners who smoke."*[249]

Based on their responses, nonsmokers were further classified into those who were "smoke-sensitive" (actively avoided smoking-allowed restaurants) – 47% of the population, or "smoke-tolerant" (did not avoid smoking-allowed restaurants) – 27% of the population. Smokers were

classified as "violators" if they admitted violating the Act (10.6% of the population), "avoiders" if they actively avoided dining in smoke-free restaurants (5.9%), or "adapters" if they did not actively avoid smoke-free restaurants (9.5%).[250]

Thus, 47% of the general population will actively avoid smoking-allowed restaurants, and these diners are responsible for twice as much restaurant revenue as violators and avoiders combined (16.5% of the population). Because total smoke-free dining accommodates 83.5% of the population (non-smokers plus adapters), the Cornell researchers recommend that catering to that market rather than to non-adapting smokers is the wiser investment for restaurateurs:

> *"That target market is responsible for nearly 80% of consumer restaurant spending.... Clearly, operators would be remiss if they simply ignored this sizable majority.... A restaurateur's challenge[therefore] is to determine which kinds of consumers she or he wishes to please.... As a group, smokers account for nearly 2.5 times less overall restaurant revenue than nonsmokers.... Operators who choose to focus on the smoking population put all their eggs in a very small basket.... A niche strategy targeting such a small group may be short-sighted.... The niche will become saturated and supply will exceed demand...(and) smokers may alter their attitudes and become more accepting of smoke-free legislation."*[251]

That marketing strategy is echoed by Tim Zagat, publisher of Zagat restaurant surveys: *"Since the majority of people are nonsmokers, [the Smoke-Free Air Act] is more likely to be good for business than bad."*[252] As noted above, the 1996 Zagat NYC Restaurant Survey, a standard hospitality industry survey covering over 1,800 restaurants, reported that eating out was up 22% over 1995 and the highest weekly pace recorded in over a decade. Per meal spending was also up 1.5%.[253]

The Cornell study concludes:

> *"On the whole, the population of New York City restaurants has not been negatively affected economically. The increased revenue from smoke-sensitive patrons balances the decline from violators and avoiders. It is likely that, as in other cities where smoke-free legislation has been enacted, sales-tax receipts from restaurants will ultimately prove that the Smoke-Free Air Act has no impact on total restaurant revenue in New York City. Moreover it may well be that over time, as smokers become resigned to living within the act's parameters, restaurant revenues will grow as smokers' dining behavior rebounds to pre-act levels.....*
>
> *"Our findings suggest that New York City's restaurateurs should 'lighten up' instead of trying to cater to those who insist on 'lighting up:' The data indicate it is unwise to try to please everyone. Lightening up may just mean pleasing the nonsmoking majority and making more money in the long run. At the very least restaurateurs should make business decisions based on data, not opinion. Ultimately, smoke-free legislation is likely to have a positive impact on*

*restaurant-industry revenues. Our advice to other cities and municipalities is to consider similar legislation. The restaurant industry collectively may experience higher revenues through smoke-free legislation."*[254]

This study was subsequently critiqued by M.K. Evans, who identified various methodological problems in the survey, and asserted that if corrections were made, results would show a 9% decline in restaurant revenues.[255] However Hyland, Cummings and Nauenberg's subsequent analysis of taxable sales receipts confirmed the original findings of the Cornell researchers, and found no evidence of Evans' projected decline in sales. They further tested and confirmed the Cornell results in a separate patron survey (6.2.3 below).[256]

But Evans' critique does indicate that survey data should never substitute for objective and verifiable sales tax data in assessing overall impacts on restaurant revenues. What the survey data can do, which the sales tax data cannot, is to identify different sub-group behaviours and thereby to assist restaurateurs in the market adjustments necessary to cater to a changing clientele. The Cornell study is the first to accomplish that objective, and its results should be used for that purpose.

### *6.2.3 Buffalo Cancer Institute Survey of NYC Consumer Response*

Fourteen months after the Cornell survey, research scientists at the Roswell Park Cancer Institute in Buffalo, New York, tested the Cornell results and also substantially increased the sample size to 1,002 adult restaurant patrons.[257] They also undertook separate studies of taxable sales receipts to assess impacts of the Smoke-Free Air Act on actual restaurant revenues (5.7 above), and of restaurant employment, and restaurateur reports of economic impacts.

Randomized telephone interviews with New York City restaurant patrons were conducted in November and December, 1996, 18 months after the Smoke-Free Air Act took effect. The results confirmed the prediction of the Cornell researchers (whose interviews were conducted four months after enactment) that smokers would gradually adapt to the restrictions over time, and become resigned to living within the parameters of the Act. As a result, they predicted, smokers' dining levels would rebound to pre-Act levels.

The Cornell researchers had classified 16.5% of respondents as "violators" or "avoiders" (smokers unwilling to adapt to the smoke ban) and only 9.5% as "adapters." Fourteen months later the "non-adapters" had shrunk to only 10% (4% "violators" and 6% "avoiders,"), while the "adapters" had grown to 18%.

Four months after the smoke ban, the Cornell researchers had concluded that *"total smoke-free dining may accommodate as much as 83.5% of the population (all nonsmokers and smokers willing to dine smoke-free environments.)"*[258] Eighteen months after the ban, it appeared that total smoke-free dining could accommodate 90% of the population, as smokers gradually adapted to the restrictions.[259]

Survey results also indicated that:

- 78% of respondents dined out as frequently as they did before the law took effect;
- 85% supported the new law;
- 57% of respondents reported being bothered by second-hand smoke, and
- 67% would like to see the Smoke-Free Air Act expanded to include restaurants with 35 or fewer seats.

Overall, the researchers found:

> *"The overwhelming majority of respondents reported they were largely unaffected by the law or dined out more frequently since the law took effect; however, there was a small percentage of consumers that reported dining out less frequently.... The New York City Smoke-Free Air Act appears to have had little impact on the dining out patterns of consumers."*[260]

These conclusions were confirmed by the researchers' three companion studies:

- The sales tax data found that the smoke-free law did not impact negatively on actual restaurant, bar or hotel sales (See section 5.7 above).
- The employment survey found an 18% increase in restaurant employment between 1993 and 1997, with 19,347 jobs added, compared to only a 5% increase in the rest of New York State where smoke-free ordinances did not exist.[261]
- A cross-sectional telephone survey of 434 owners and managers of New York City restaurants found no evidence to suggest that the smoke-free law had a detrimental effect on the City's restaurant business.[262]

### *6.2.4 Massachusetts Surveys of Restaurant and Bar Patrons*

Massachusetts survey data confirm the findings that smoke-free policies would not adversely affect restaurants and bars. Indeed, the survey results indicate that many people would frequent such establishments more often if they were smoke-free.[263]

Random-digit dialing techniques were used to survey a representative sample of 2356 Massachusetts adults by telephone from March to December, 1995, to assess how smoke-free ordinances would impact the behaviour of restaurant and bar patrons. About 61% of respondents predicted no change in their use of restaurants in response to smoke-free policies, 31% predicted increase use, and 8% predicted decreased use.[264]

The results were little different for bars, with 69% of respondents predicting no change in patronage, 20% predicting increased use, and 11% predicting decreased use. The authors concluded:

> *"These results suggest that smoke-free policies are likely to increase overall patronage of bars and restaurants.... This study provides further evidence that workers can be protected from hazards of environmental tobacco smoke without adverse consequences for bar and restaurant business."*[265]

Other survey questions shed light on the potential for increased restaurant and bar usage by nonsmokers, and indicate that ***policies allowing smoking may actually be bad for business***. Among all Massachusetts respondents, 64% reported that they were bothered "a great deal" or "some" by environmental tobacco smoke. Nearly 40% said they had avoided going to a place because of tobacco smoke. Of these individuals, 34% indicated they had avoided restaurants that allowed smoking and nearly 40% said they had avoided bars or clubs. In contrast, only 8.5% of respondents reported having avoided going somewhere because smoking was not permitted.

These findings confirm the Cornell University study (6.2.2 above) that an increase in patronage by nonsmokers (the vast majority of the population) can more than make up for any decrease in patronage by smokers. The Massachusetts study in fact *"found a potential new market for bars among nonsmokers."* Of the 32% of adults who did not frequent bars, 10% stated that they would ***start*** going if smoking were eliminated.

Other studies have estimated the likelihood of increased or decreased frequency of use among *current* patrons due to smoke-free policies. But the Massachusetts study was the first to estimate the potential for a new market among non-users. The authors found about 120,000 Massachusetts adults who did not presently frequent bars and clubs would likely start doing so if they were smoke-free, and that 40,000 who did not eat out at restaurants would start doing so if they were smoke-free.[266]

Extrapolating these results to Nova Scotia, more than 18,000 Nova Scotians who do not presently go to bars are likely to do so after smoke-free legislation takes effect, and an additional 6,000 who do not presently eat out would begin to do so when restaurants become smoke-free. These new market entrants are a potential *additional* economic bonus for bar and restaurant owners above and beyond the potential increased patronage by nonsmokers who *currently* frequent eating and drinking establishments.

In fact a second Massachusetts survey of 4,929 adults in 1995-96, large enough to correlate behaviours with socio-demographic characteristics, provides important marketing information for restaurant and bar owners seeking to attract a new non-smoking clientele. This survey found that those most likely to avoid smoky bars and restaurants are in the 25-44 age group, female, married, and with higher education. Reasons given by respondents for smoke avoidance included smell in clothing and hair (35%), health concerns, including allergies and pregnancy (32%), and physical discomfort such as sneezing and burning eyes (25%).[267]

Such patron information can clearly assist restaurateurs and bar owners in adjusting the atmosphere, ambience and offerings of their establishments to a clientele that may hitherto have avoided them.

That survey's aggregate data are also reassuring for bar owners because they indicate that more non-smokers avoid going to bars and smoking-allowed restaurants than there are smokers who frequent such establishments. Thus, 880,000 Masschusetts non-smokers were found to avoid smoky bars, 10% more than the total number of smokers in the whole state, indicating that a smoking ban can provide net economic benefits for the bar business.[268]

### 6.2.5 *Restaurateur Concerns versus Actual Experiences 1: Arizona*

One of the most unique and revealing surveys to date has assessed whether the fears and concerns of restaurant owners *prior* to enactment of smoke-free legislation were realized after the ordinances came into effect.[269] Interviews were conducted in Flagstaff, Arizona, one month prior to and 15 months after enactment of that city's smoke-free ordinance. The results found that most concerns were not realized.

For example, 44% of interviewed restaurateurs expressed concern, prior to enactment of the ordinance, that prohibiting smoking would upset customers. Fifteen months later, only 14.7% felt that overall customer reaction was negative, while 58.8% reported that customer reaction was positive, and 26.5% reported that the ordinance had little or no effect on customer attitudes.

Even more striking was the fact that only one respondent (2.9% of survey sample) said that customer reaction was "*very* negative" while 35.2% said it was "*very* positive." As well, 88.2% of respondents felt that the ordinance had either no effect or a positive effect on employees. Before the ordinance, 27% of respondents were concerned that it would be difficult to enforce. Fifteen months later, 94% reported that they had found it easy or very easy to enforce.

In short, the apprehension that often accompanies policy change, was found to be unwarranted in actual fact. Typical of restaurateur responses after enactment of the ordinance were the following comments:

- *"Most customers are non-smokers and feel this is a benefit for everyone. They think it is a great idea."*
- *"There are more non-smokers than smokers, so there are more positive than negative reactions."*

Other restaurateurs reported that smokers who initially stayed away soon returned:

- *"Some people said they would never come back after the ordinance went into effect, but they did return."*

### 6.2.6 *Restaurateur Concerns versus Experiences 2: Quebec*

Three much larger surveys, of businesses in Quebec, confirmed the Arizona results that business concerns prior to enactment of smoking restrictions were unfounded. In 1997, the Quebec government commissioned Pierre-Yves Cremieux and Pierre Oulette of the Department of Economics at the Universite du Quebec a Montreal to design, direct and analyze surveys of 400 firms, 200 large firms (200 employees or more), and 401 restaurants. Survey response rates were high – 88% of all firms, 92% of large firms, and 91% of restaurants.[270]

The proposed Quebec legislation gave restaurant owners and employers a choice of simply prohibiting smoking within their establishments or of constructing separate, enclosed, and ventilated smoking areas with negative air pressure and direct smoke evacuation outside the building. The purpose of the surveys was to assess the anticipated and actual economic costs to business of the proposed legislation, including infrastructure costs, and impacts on productivity, absenteeism and potential lost clientele. The surveys were conducted prior to enactment of the

legislation, and were large enough to compare actual costs among those firms that had already complied with the proposed restrictions with anticipated costs among firms that had not.

The surveys found the actual direct and indirect costs associated with tobacco regulation to be minimal. Even where closed, ventilated smoking areas were constructed, *actual* annualized infrastructure costs amounted to less than 0.0002% of firm revenues and 0.15% of restaurant revenues. This was less than half of what firms anticipated those costs to be, and about one-third of what restaurateurs anticipated. The law would, of course, impose no direct infrastructure costs on the majority of firms and restaurants that said they would forbid smoking completely.

Firms and restaurants widely anticipated that the proposed smoke-free legislation would negatively impact productivity, absenteeism and restaurant patronage. Among restaurants without a non-smoking policy in place, 60% believed their revenues would fall in response to the proposed law. However, none of these impacts were actually served among establishments that were already compliant with the proposed restrictions.

The authors surmise *"that tobacco companies' active propaganda has led firms without such policies to overstate expected costs"* and they conclude:

> *"Firms and restaurants expected high costs to result from strict tobacco regulation because of infrastructure costs, decreased productivity, and decreased patronage. That none of these were actually observed suggests that policy makers should discount industry claims that smoking regulations impose undue economic hardship."*[271]

Discussing their findings, the authors state:

> *"A majority of respondents not currently in compliance feared a negative impact on sales, despite the opposite results found in compliant Quebec firms and by numerous studies in the literature. Lacking experience of a ban, perhaps these firms and restaurants were simply risk averse and overestimated the negative impact of a ban.*
>
> *Years of tobacco industry lobbying against workplace and restaurant smoking regulation might also have distorted their estimation. Indeed, tobacco companies have become increasingly active politically to defeat anti-smoking laws and ordinances, often retaining professional campaign and public relations firms and concealing their own involvement. This would explain, in part, a fear of the regulation that appears to lack empirical grounding.*
>
> *Together, the results from surveys of both firms and restaurants show that even in a high smoking prevalence area such as Quebec, a relatively strict law regulating smoking on-the-job and in restaurants is unlikely to have any major negative economic impact on either industry. It also shows that the experience of firms and restaurants already in compliance with the law is consistent with the literature*

*and indicates no adverse effects, and that the expectations of non-compliant firms and restaurants are likely to be overstated."*[272]

### *6.2.6 Other Studies*

The remarkable consistency of results from all the studies examined confirms definitively that smoke-free legislation does not adversely affect business in general, or restaurant, bar and hotel sales in particular. Some studies find evidence that smoke-free legislation may be good for business and increases sales, but these results are not consistent enough to draw any firm conclusion.

There is also some evidence from two of the studies cited -- Mesa, Arizona, and liquor (but not food) sales in British Columbia -- that sales may temporarily drop in the first month or two following enactment of legislation, and then increase. However, no study using objective data has found an aggregate or net drop in long-term sales, and the B.C. study found an increase in sales by the third month after enactment of the smoking ban.

The survey data presented in this section further indicate that increased patronage by non-smokers more than compensates for a potential decline in patronage by some smokers, and that smokers themselves are likely return to their former restaurant and bar habits after a short time. It is worth concluding this section with a brief review of other studies, including opinion surveys, that are mentioned in literature reviews on smoke-free ordinances:

- A 1986 survey of 490 shops and 161 restaurants in Winnipeg, Manitoba, three years after enactment of a clean indoor air bylaw found that less than 2% of merchants felt the bylaw had an adverse effect on business.[273]

- An opinion survey of 352 restaurant owners and 1,327 customers in two cities in New South Wales, Australia, found that 89.2% of customers preferred smoke-free areas; and that owners *underestimated* customer preference for smoke-free areas by 55%.[274] This confirms the findings in 6.2.5 and 6.2.6 above, that restaurateur concerns are not borne out by actual experience.

- Two studies (5.6 and 6.2.5 above) examined the impact of a smoke-free ordinance in Flagstaff, Arizona. An earlier (1993) study found that gross sales in retail stores increased an average of 16-26% per store during the year following the prohibition of smoking in these stores. A large majority of both restaurant and store owners and managers surveyed confirmed that the ordinance had no effect on business.[275]

- A random telephone survey of 5,699 respondents in the lower mainland and capital health region of British Columbia found that 70% of adults usually request no-smoking areas in restaurants and bars. Most patrons of eating, drinking and gaming establishments report that smoke-free bylaws would either make no difference or would slightly increase their patronage. 22% of restaurant patrons say they would eat out more often if smoking were not allowed; 13% say they would eat out less often.[276]

- A random telephone survey of 18,030 respondents in 18 British Columbia health regions found that 86% of respondents wanted non-smokers to have a smoke-free environment at work, and 72% supported a bylaw barring smoking in indoor public places.[277]

- A random telephone survey of 600 BC residents from throughout the province found that 89% of smokers and 93% of non-smokers believe that non-smokers should be provided with a smoke-free workplace. Also 74% of respondents, including 51% of smokers, supported making all workplaces smoke-free.[278]

- A randomized telephone survey of 1,000 BC bar patrons in September, 1999, found that 78% either do not smoke (71%) or smoke only occasionally (7%). Also 78% of bar patrons say that the smoke-free law either makes no difference to the length of their stay in a bar, or else the length of their stay would increase. Fully 94% of respondents favour a smoke-free workplace.[279]

- A province-wide random telephone survey of 600 adults throughout BC, conducted by the Workers Compensation Board in June 1999, found that more than 90% of British Columbians believe non-smokers should be provided with a smoke-free work environment. 73% said they are likely to patronize a public establishment that is entirely smoke-free; and 86% are likely to patronize an establishment that is either completely smoke-free or possesses an outdoor smoke break area or a totally separated smoking room.[280]

- The BC Workers Compensation Board also analyzed assessable payrolls in Victoria restaurants, food concessions, pubs and bars before and after the city's smoking ban came into effect on January 1, 1999, and it compared performance to nearby communities (Duncan and Nanaimo) without smoking bans. Pubs and bars in smoke-free Victoria did 5% better in 1999 than in 1998, while Nanaimo experienced a 7% decline and Duncan remained the same. Restaurants and food concessions in Victoria also did better in 1999 than in 1998 and outstripped performance in both Duncan and Nanaimo.[281]

- A similar analysis was conducted for liquor sales data in licensed establishments for the first three quarters of 1998 and 1999 in the Capital Regional District (Victoria area) and other regions. Pub sales in the smoke-free Capital Regional District increased by 4.5% during this period, while Duncan, Nanaimo and the rest of Vancouver Island (all without smoking bans) showed negative growth of between –3.5% and –5.5%.[282]

- Two California studies conducted at the same time demonstrate clearly the perils of relying on partisan owner/manager surveys, as described in 6.2.1 above. In March, 1998, the American Beverage Institute (ABI) conducted a telephone survey of 300 owners and operators of bars, taverns and night clubs (4% of the California total), with 7 out of 13 questions focusing solely on negative effects of the state's ban on smoking in bars. The ABI reported that 59% of those surveyed said they had experienced a decrease in business.[283]

  The State of California Board of Equalization analyzed and compared *actual* taxable sales revenues state-wide for 6,211 single location accounts with a general on-sale liquor license

for the 1st quarters of 1997 and 1998, before and after the state ban on smoking in bars came into effect. The State reported that aggregate sales had in fact *increased* following introduction of the ban.[284] The Board of Equalization is the official agency in California that collects sales tax data and issues quarterly and annual reports.

- An even more extensive three-year analysis by the California Board of Equalization was conducted both for 4th quarter and for annual sales in both bars and restaurants for the years 1996, 1997 and 1998 for the entire state. California banned smoking in restaurants in January, 1995, and in bars, taverns and gaming clubs in January, 1998.

  Data showed an increase in taxable sales for all types of eating and drinking establishments from 1996 to 1998. 1997 restaurant sales in places that did not serve liquor were 6.4% higher in 1997 than in 1996. In 1998, after the bar smoking ban took effect, sales in stand-alone bars and other drinking/eating establishments increased 5.1% over the previous y ear. Taxable sales in California's beer, wine and liquor serving establishments were $880 million higher in 1998 than in 1997, an increase that outpaced sales in all retail outlets by 7.7%.[285]

- Monthly studies conducted by the Aspen Resort Association found that total retail sales, including restaurants, actually increased after the City's 100% smoke-free ordinance went into effect. A study conducted by the Aspen/Pitkin Environmental Health Department found broad support for the ordinance among restaurants and retailers, and "*no negative effect on business whatsoever.*"[286]

- Boulder, Colorado, sales tax receipts from "eating places" (including bars and restaurants) rose by 4% between January and October, 1996, following passage of a smoke-free bar and restaurant ordinance in November, 1995, and business for restaurants and bar owners fared better than for other city merchants during the same period.[287]

- A major 1996 survey of attitudes and behaviours related to tobacco use by York University's Institute for Social Research found that 52% of Toronto area customers avoided certain restaurants because of the smoke; 59% avoided smoky bars and taverns. 76% said they would wait up to 15 minutes for a table in a non-smoking section or else go to another restaurant; while only 24% would take a table in the smoking section if it were the only table available.[288]

- A 1992 survey of convention groups that came to San Diego, California, in 1991-92, found that 38 out of 40 conventions, representing 168,140 delegates, would continue to schedule conventions in San Diego if the city adopted a smoke-free restaurant ordinance. *Only* the 6,700 members of the tobacco and candy industries said they would not return.[289]

- A huge telephone poll in the UK found 86% of respondents (57,385 people) favouring an outright ban on smoking in restaurants.[290]

- More than 86% of California adults feel that all workplaces should be smoke-free, and 88% of Californians prefer to eat in smoke-free restaurants.[291]

- Several months after the January 1, 1998 ban on smoking in California bars, a poll of 1,514 adults found that 50% strongly supported the ban, with an additional 10% somewhat approving it. Only 26% strongly disapproved of the ban and 9% were less strongly opposed to it.[292]

- Because the tobacco industry frequently argues that smoking bans create problems of non-compliance, it is significant that a 1996 Ontario survey of smokers found that less than 10% would ignore increased restrictions on smoking.[293] This finding confirms other studies that have found restaurateurs' fears of smoker non-compliance and difficulties of enforcement to be unfounded (6.2.5 above).

  Once bans are implemented, evidence shows they are widely accepted by smokers.[294] For example, there have virtually no enforcement or implementation problems with the Canadian federal *Non-Smokers' Health Act* that protects federal workers from exposure to second-hand smoke.[295]

- The Vancouver Medical Office of Health has argued that the benefits of smoking bans in restaurants have been understated because patron waiting time will be reduced with the abolition of smoking sections; maintenance costs will decrease; staff will lose less work time due to respiratory illness; and employers will experience reduced liabilities and fire risk.[296]

- The 1996/97 Canadian Population Health Survey found that 88% of current smokers and 95% of non-smokers agreed that non-smokers should have smoke-free work areas.[297]

- Of 7,975 Newfoundland adults surveyed in the May, 2001, provincial health survey, 40% reported being exposed to second-hand smoke on most days, and 65% reported being somewhat (34%) or extremely (31%) bothered by second-hand smoke. Most significantly, an overwhelming 87% of respondents supported a "No Smoking Policy" in public places.[298]

- The most recent survey evidence indicates that 76% of Nova Scotians want the province to ban smoking in restaurants, bars, rinks, malls and all other public venues. 56% were completely in favour and 20% were mostly in favour, while only 13% completely opposed the smoking ban and 11% were mostly opposed. Support for the ban was consistently high among both women and men across the province and in all age, income and educational groups.[299]

# PART IV
# THE POLITICS OF SMOKE-FREE LEGISLATION

## 7. Review of the Evidence

Let us review the evidence presented thus far:

1.There is a consensus among the most reputable scientific and medical academies and government agencies on the serious health hazards of environmental tobacco smoke:

> Exposure to second-hand smoke causes heart disease, lung cancer, nasal sinus cancer and respiratory ailments in adults, and it causes sudden infant death syndrome, fetal growth impairment and a wide range of respiratory conditions in infants and children, including bronchitis, pneumonia, middle ear disease and asthma exacerbation. ETS exposure causes about 200 deaths per year in Nova Scotia.
>
> In restaurants, second-hand smoke levels are twice as high as in other workplaces. In bars and casinos they are 3-6 times as high. Food service workers have a 50% higher rate of lung cancer than the general population.
>
> More recent research has linked ETS exposure to cervical and breast cancer, stroke, and miscarriages in adults; and to asthma induction, decreased lung function, cystic fibrosis, and cognition and behaviour problems in children.[300]

2. Expert assessments, empirical evidence, risk assessment procedures, and internationally accepted indoor air quality and ventilation standards have determined that ventilation and non-smoking sections do not remove the toxic constituents of tobacco smoke from the air and provide no solution to the problem of exposure to second-hand smoke.

> Instead the recommendations of expert scientific panels are "*clear, consistent and unanimous – **all involuntary exposure is harmful and should be eliminated.**"*[301] The U.S. Surgeon-General has called for *"100% smoke-free environments in all public areas and workplaces, including all restaurants and bars."*[302]

3. Smoke-free workplace legislation would reduce ETS exposure by 80%, cut cigarette consumption among smokers by 20%, and save Nova Scotia an estimated $200 million a year in avoided health care costs ($50 million) and productivity losses ($150 million).

4. Without exception, every objective study using official sales tax data demonstrates that smoke-free legislation has no adverse impact on restaurant, bar, hotel and tourism receipts. Two studies find an initial decline in receipts in the first 1-2 months following enactment, but no evidence of any overall or aggregate decline in the longer term. Indeed, some studies indicate that smoke-free legislation may be good for business as non-smokers frequent eating and drinking establishments more often and smokers adjust to the new rules.

Given the consistency of the evidence, the enormous and costly toll of second-hand smoke exposure, the economic benefits of smoke-free workplace legislation, and the demonstrated lack

of any adverse impact on business, it is difficult to understand why there should be any resistance to such legislation. This is particularly true in light of the growing body of legal precedent indicating that governments and employers are bound by law to ensure safe working environments for employees and to remove known health hazards from the workplace.

Past obstacles to smoke-free workplace legislation can, therefore, only be understood by reference to tobacco industry resistance and opposition. Tobacco industry documents show that public smoking restrictions and higher tobacco taxes are the two government actions seen by the tobacco industry as most threatening to cigarette sales and profits, and have therefore elicited the industry's strongest reactions. For this reason, legislators should be aware of past industry efforts to undermine such legislation and be prepared for the kinds of tactics used.

## 8. Tobacco Industry Strategies...in the Industry's Own Words

Tobacco industry resistance to smoke-free legislation includes the following strategies:

1) Deny the scientific evidence on the health hazards of ETS by finding fault with study methodologies and by funding scientists to publish articles to that effect. Downplay risks when the evidence can no longer be denied. For example, concede that some non-smokers may find ETS annoying, unpleasant or discomforting.

2) Work through and secretly fund third parties, especially restaurant, bar and hotel associations by spreading fears that the legislation will harm their business. Tobacco industry assertions to that effect have never been substantiated by empirical evidence.

3) Water down legislation; delay its implementation; shift the focus of debate from public health to market choice and self-regulation; and argue that ventilation can "accommodate" both smokers and non-smokers, despite evidence to the contrary.

Some of these strategies will be briefly surveyed here, first in the tobacco industry's own words, and then by reference to three published analyses of the politics of smoke-free legislation.

As a result of litigation in the United States, the tobacco industry was forced to disclose millions of pages of confidential internal documents many of which are now publicly available on the World Wide Web. The U.S. Centers for Disease Control and Prevention (CDC) has compiled links to all of the major document sites for the U.S.-based tobacco companies. Health Canada and the U.K. based Action on Smoking and Health (ASH) also have links to these documents.

In total, 33 million pages of tobacco industry documents are held at the State of Minnesota Depository, created as a result of a successful lawsuit by the Attorney General of Minnesota and Blue Cross/Blue Shield of Minnesota against the seven major American tobacco companies. The suit was settled in 1998.[303]

The following quotations, specifically on second-hand smoke, have been accessed through the ASH web site.[304] However, the footnoted citations will allow the reader to access these particular documents directly through the CDC or any other document sites.

## 8.1 Smoke Bans Threaten Industry Profits

As noted above, tobacco taxes and smoking bans are seen by the industry as the two greatest threats to its sales and profits.

> *"Of all the concerns, there is one – taxation – that alarms us the most. While marketing restrictions and public and passive smoking do depress volume, in our experience taxation depresses it much more severely. Our concern for taxation is, therefore, central to our thinking about smoking and health. It has historically been the area to which we have devoted most resources and for the foreseeable future, I think things will stay that way almost everywhere" (Philip Morris).*[305]

In its internal communications, the tobacco industry has also clearly recognized that smoking bans are a threat to its bottom line, and has determined to resist them in order to protect sales and profits:

> *"What the smoker does to himself may be his business, but what the smoker does to the nonsmoker is quite a different matter.... This we see as the most dangerous development yet to the viability of the tobacco industry that has yet occurred" (U.S. Tobacco Institute).*[306]

> *"It is apparent that the effects of ETS on others is now the most powerful antismoking weapon being employed against the industry" (Philip Morris).*[307]

> *"The immediate implication (of smoking bans) for our business is clear: If our consumers have fewer opportunities to enjoy our products, they will use them less frequently and the result will be an adverse impact on our bottom line" (Philip Morris).*[308]

> *"What do these health claims, the heightened public sentiment for smoking restrictions, increasing nonsmoker annoyance towards smokers mean for this industry? Lower sales, of course. The Tobacco Merchants Association took a look at smoking restriction legislation and cigarette consumption between 1961 and 1982. The conclusion: that restrictive smoking laws accounted for 21 percent of the variation in cigarette consumption from state to state during that time....*
>
> *Those who say they work under restrictions smoked about one-and-one-quarter fewer cigarettes each day than those who don't.... That one-and-one-quarter per day cigarette reduction then, means nearly 7 billion fewer cigarettes smoked each year because of workplace smoking restrictions. That's 350 million packs of cigarettes. At a dollar a pack, even the lightest of workplace smoking restrictions*

*is costing this industry 233 million dollars a year in revenue" (Tobacco Institute).*[309]

## 8.2 Strategies to Oppose Smoke Bans

To protect its profits, the tobacco industry has aggressively opposed smoke-free legislation, and attempted to "deflect" and "redefine" the issue so as to *appear* publicly responsible while actually preventing protective safety measures.

> *"Over the past dozen or so years we have faced more than 1,000 public smoking bills and have defeated more than 90 percent of them. Those we have defeated are typically reintroduced year after year, often redrafted to accommodate legislators' objections.... The Institute – as a matter of policy and practice – is organized to aggressively oppose legislation of this sort" (Tobacco Institute).*[310]

According to the President of the Tobacco Institute President:

> *"The logical appeal of smoke-free air is irresistible to politicians, commentators, even some smokers. It is the most effective way to reduce smoking.... As obvious as it may seem, out objective is to contain and refine the environmental smoke issue in order to decrease the pressure for safety measures....*
>
> *So far, our industry is seen as part of the problem, promoting a 'dangerous' custom, successfully resisting protective measures, doing nothing to satisfy public expectation. Some aspects of our fight on this issue have contributed to the antis' greater exposure and credibility.*
>
> *To summarize, the direction we are headed will be to deflect this issue, to redefine it, to broaden it, to demonstrate as we have in the case of accidental fires and youth behavior that we are contributing to the solution rather than to the problem" (Tobacco Institute).*[311]

The strategy, according to Philip Morris is to *"Focus on* ***costless areas of compromise*** *– e.g. 'We will accept a no-smoking 'policy' bill for elevators if you need to pass something."* [312]

Philip Morris outlined its goals and strategies bluntly:

> *"End Goals:*
> *Resist smoking restrictions*
> *Restore smoker confidence*
>
> *Prerequisites:*
> *Reverse scientific and popular opinion*
> *Restore social acceptability of smoking*
> *Preserve product liability defences" (Philip Morris).*[313]

The industry campaign was global. In Asia:

> *"Our objective is to limit the introduction and spread of smoking restrictions and maintain the widespread social acceptability of smoking in Asia" (Philip Morris).*[314]

A Philip Morris memo is equally blunt about industry strategy to deny the health hazards of second-hand smoke, to create "marketable science," and deflect the issue to one of "annoyance":

> *"Andrew Nelmes (from Gallaher) outlined the UK strategy on ETS. That strategy is made of three components: (1) challenging unfounded reports linking ETS and human disease, (2) placing ETS in the proper perspective with regard to overall air quality, and (3) disassociating the public's annoyance with ETS from alleged health effects. By this strategy, TAC (Tobacco Advisory Council) hopes to (1) create 'marketable' science, (2) to deflect criticism of ETS, and (3) to place the industry in the most favorable position possible" (Philip Morris).*[315]

## 8.3 Creating "Marketable Science"

Industry scientists have privately recognized the credibility of evidence on the health hazards of second-hand smoke for more than 20 years, while publicly denying the evidence:

> *"I have reviewed the above paper (on ETS-induced small airways damage in non-smokers) and find it to be an excellent piece of work which could be very damaging to our business. There are several things that can be done to minimize its impact" (Philip Morris).*[316]

To create its unique brand of "marketable science" that "minimizes" the health impacts of ETS, the tobacco industry, led by Philip Morris, actively recruited scientists and consultants (including an editor of the prestigious British medical journal, *The Lancet.)* Unbeknownst to the public, these industry-funded scientists acted as arms-length 'third-party" advocates for the industry. Industry documents outline the elaborate recruitment scheme:

> *"Philip Morris presented to the UK industry their global strategy on environmental tobacco smoke. In every major international area...they are proposing, in key countries, to set up a team of scientists organized by one national co-ordinating scientists and American lawyers, to review scientific literature or carry out work on ETS to keep the controversy alive. They are spending vast sums of money to do so....*
>
> *CVs are obtained and obvious 'anti-smokers' or those with 'unsuitable backgrounds' are filtered out.... Philip Morris then expect the group of scientists to operate within the confines of decisions taken by PM scientists to determine the general direction of research, which apparently then be "filtered" by lawyers to eliminate areas of sensitivity." (Philip Morris).*[317]

> *"Lancet: One of our consultants is an editor of this very influential British medical journal, and is continuing to publish numerous reviews, editorials, and comments on ETS and other issues" (Covington and Burling).*[318]

In the 1990s, Philip Morris undertook the most expensive and determined campaign yet to subvert scientific research on the health effects of second-hand smoke. A multimillion dollar industry effort to undermine a major study by the International Agency for Research on Cancer (an affiliate of the World Health Organization) on the dangers of ETS aimed to:

1. *"Delay the progress and/or release of the study.*
2. *Affect the wording of its conclusions and official statement of results.*
3. *Neutralize possible negative results of the study, particularly as a regulatory tool.*
4. *Counteract the potential impact of the study on governmental policy, public opinion, and actions by private employers and proprietors" (Philip Morris).*[319]

Finally, one of the most interesting industry statements, in light of ongoing "dire" industry predictions about the adverse impact of smoke bans on restaurant, bar and hotel sales, is a frank admission that these predictions are in fact unfounded. According to David Laufer, Philip Morris's director of marketing and sales, in 1994:

> *"...the economic arguments often used by the industry to scare off smoking ban activity were no longer working, if indeed they ever did. These arguments simply had no credibility with the public, which isn't surprising when you consider our dire predictions in the past rarely came true" (Philip Morris).*[320]

## 8.4 Lobbying through Third Parties

Because of its own poor reputation, the tobacco industry now lobbies almost entirely through arms-length third parties, taking great pains to ensure that the relationship to industry remains well hidden. Again, a wide array of internal, confidential company documents outline this strategy on a global scale.

Philip Morris noted that it was "expanding its contacts" in industry, trade, tourism and consumer organizations, *"broadening our contacts in the union movement,...cultivating the bureaucracy,"* and providing for *"special funding needs"* of members of Parliament and Congress.[321] As noted earlier, the Hotel Association of Canada has so far received $3.2 million from the Canadian Tobacco Manufacturer's Council to operate its "Courtesy of Choice" campaign.[322]

By working through third parties, the tobacco industry can also shift the focus from public health to other issues like tourism sales, "accommodation" of smokers and non-smokers, and business freedom, while remaining completely out of public sight:

> *"...we try to keep Philip Morris out of the media on issues like taxation, smoking bans, and marketing restrictions. Instead we try to provide the media with*

*statements in support of our positions from third party sources, which carry more credibility than our company and have no apparent vested interest...*

*"...we try to change the focus on the issues. Cigarette tax become(s) an issue of fairness and effective tax policy. Cigarette marketing is an issue of freedom of commercial speech. Environmental tobacco smoke becomes an issue of accommodation. Cigarette-related fires become an issue of prudent fire safety programs. And so on" (Philip Morris).*[323]

Critical to this refocusing of particular issues is also re-framing the entire debate:

*"Portray the debate as one between the anti-tobacco lobby and the smoker, instead of 'pro-health public citizens versus the tobacco industry" (Philip Morris).*[324]

Such tactics have been used in Nova Scotia to delay and derail plans to pass provincial smoke-free legislation in the past. In 1997 the Hotel Association of Canada hired John Luik, a "public policy analyst," to address the Hotel Association of Nova Scotia and critique the results of the Nova Scotia Department of Health's discussion paper "Smoke-Free Places: Towards Healthier Communities in Nova Scotia"[325]. Mr. Luik denied the argument that second-hand smoke is a public health hazard and called the discussion paper fraudulent.

Four years later, in a 2001 article in the Montreal Gazette, Mr. Luik was discredited and exposed as a paid tobacco lobbyist.

*"The tobacco industry has for years waged what it has secretly described as a "multiple warhead" campaign to undermine public confidence in scientific studies linking second-hand smoke to lung cancer and heart disease, industry documents show.*

*"Big tobacco's point man is a Canadian-based philosophy and ethics teacher who was tossed out of a Canadian university and a Manitoba college for lying about his employment record and academic qualifications, the documents show. His name is John Luik and for the last 10 years he has been a high-profile frontline warrior in the tobacco industry's effort to disparage scientific studies linking second-hand smoke to cancer as "junk" and "fraudulent."..."*[326]

Nevertheless, the damage was done, and the hotel industry, in unwitting partnership with Mr. Luik and the tobacco industry, successfully lobbied against the province's proposed smoke-free legislation. As a result of the four-year delay it is likely that more than 600 Nova Scotians will die unnecessarily and many more will be disabled from continued exposure to second-hand smoke since 1997. The delay will cost the province more than $65 million in additional health care costs alone and nearly $250 million when productivity losses are included in the equation.

The Nova Scotia experience confirms that the tobacco industry will not hesitate to risk later exposure for immediate gain. The tobacco industry documents indicate a clear awareness by industry executives that their image and credibility are already badly tarnished.[327] Presumably the tobacco sales gains in Nova Scotia and other jurisdictions in recent years have been well worth Mr Luik's belated exposure, which received no publicity in this province and provoked no reference to his earlier "expert" testimony to the Hotel Association of Nova Scotia.

## 8.5 Has the Tobacco Industry Changed?

As a result of negative publicity, litigation, and overwhelming evidence on the health hazards of second-hand smoke, the tobacco industry is now actively repositioning itself to establish an image of "corporate responsibility" (R. J. Reynolds and Philip Morris) and "responsible behaviour in an industry that is often seen as controversial" (British American Tobacco.)[328]

After carefully reviewing in 2000 all the new postures adopted by Philip Morris, BAT, Japan Tobacco, Imperial Tobacco, and Gallaher, the UK House of Commons Health Committee concluded:

> *"It seems to us that the companies have sought to undermine the scientific consensus until such time as that position appears ridiculous. So the companies now generally accept that smoking is dangerous (but forward distracting arguments to suggest that epidemiology is not an exact science, so that the figures for those killed by tobacco may be exaggerated); are equivocal about nicotine's addictiveness; and are still attempting to undermine the argument that passive smoking is dangerous."*[329]

In order to downplay the health risks of second-hand smoke, the tobacco industry emphasizes the "bothersome" aspects and casts doubt on the objective scientific evidence and medical data by stating that "some people believe" there are health risks. The following statements are from current industry materials:

> *"R. J. Reynolds Tobacco Company understands that many people find secondhand cigarette smoke annoying, and wish to avoid being bothered by it. We also understand that some people want to avoid exposure to secondhand smoke because they believe it presents a risk to their health.... There are many ways to allow smokers and nonsmokers to peacefully coexist in public places without resorting to smoking bans" (R. J. Reynolds).*[330]

> *"We know that environmental tobacco smoke can be unpleasant and annoying, and that many people believe that it presents a health risk to nonsmokers.... Smoking should not be allowed in crowded, closed spaces such as elevators; in places where there is a specific fire hazard; or in rooms primarily occupied by children, such as classroom and daycare facilities" (Philip Morris).*[331]

Despite this image of corporate responsibility and "reasonableness," as RJR and Philip Morris tried to portray themselves, the tobacco companies continue to undermine and cast doubt on the overwhelming scientific consensus on the health hazards of environmental tobacco smoke:

> *Despite the conclusion by a variety of public health organizations and government bodies, we do not believe that the scientific evidence concerning secondhand smoke establishes it as a risk factor for lung cancer, heart disease or any other disease in adult nonsmokers. However, a considerable amount of scientific research is being done in this area, and we will continue to evaluate the results of this work" (R. J. Reynolds).*[332]

Clearly the forced revelation of confidential, internal documents has led to greater subtlety and care in phrasing. Compare the language above to that of 10 and 20 years ago:

> *"Our objective remains to develop and mobilize the necessary resources – internal Philip Morris, external agencies and consultants, the industry National Marketing Associations, and all potential allies – to fight the social and legislative initiatives against tobacco.... We shall carefully target our opponents. We shall precisely identify, monitor, isolate, and contest key individuals and organizations" (Philip Morris 1989).*[333]

> *"We must discredit the antis.... We have been warned here about the danger of allowing ourselves to adopt a siege mentality. And we have heard some interesting comments questioning whether it is right, as they say in the Army, to shoot at everything that moves. But in developing countermeasures, I believe we mustn't forget that a state of war does exist" (Tobacco Institute, 1979).*[334]

That "war" mentality persisted in a determined and systematic industry campaign in the 1980s to discredit any researcher reporting on the health hazards of second-hand smoke. At a 1991 meeting of the industry's "ETS International Management Group," Philip Morris divided the universe of its potential opponents into "battlefields," that included science, litigation, media, government, employers and insurers, and transportation/public places.[335]

Analyzing the present and past documentation of the tobacco companies, the U.K.-based Action on Smoking and Health has concluded that nothing has changed in tobacco industry objectives, except for appearances and public relations strategy: The fundamental objectives, methods, attitudes and actions of the tobacco industry remain the same:

- The central objective to sell more tobacco and have more tobacco users is unchanged.
- The companies still work to cast doubt on scientific evidence and to undermine evidence-based public health measures throughout the world. They have accepted a small number of selective facts that are beyond reasonable doubt along with new qualifications and caveats.
- The companies have increased their marketing expenditures and aggressively promote tobacco use throughout the world.
- The industry has not withdrawn earlier statements now proven to be false and misleading, and no one in the industry has apologized, resigned or been fired.

- *"The tobacco industry is in a 'zero-sum' game with public health – every smoker who quits is a lost customer."*[336]

This fundamental conclusion is confirmed by Gareth Davies, chief executive officer of Imperial Tobacco:

> *"Obviously I am very much against anything that tries to reduce consumption of a legal product that is used by adults."*[337]

For these reasons it is essential for Nova Scotia legislators to anticipate tobacco industry opposition to the province's proposed smoke-free legislation, and to understand industry tactics and arguments. In particular, it is necessary to weigh the evidentiary history of tobacco industry claims and "dire predictions" against the lives and public health needs of Nova Scotians and the accumulated objective evidence of scientific bodies, medical research, and sales tax data analyses.

## 9. Assessing Tobacco Industry Claims

Detailed evidence has already been presented in this report on objective verification of claims made by the tobacco industry and its affiliates. It was found that whenever industry claims of a drop in sales were checked against objective sales tax receipts, the industry claims were found to be false.

For example, claims by the industry-created and industry-financed Beverly Hills Restaurant Association[338] of a 30% drop in restaurant sales were found to be untrue with no decline in revenues actually recorded. Similar claims in Bellflower, California, were also proven false, with actual sales data indicating an increase in sales following enactment of the smoke-free ordinance (5.2 above).

Claims of job losses in New York following enactment of partial smoking restrictions were similarly proven false, with jobs actually increasing after the smoke ban came into effect. The alleged job losses were later proved to have occurred *prior* to enactment of the ordinance (5.7 above). "None of the dire predictions that were advanced then came true," noted the New York City Department of Health at the Smoke-Free Air Act public hearing in 1994.[339]

Yet advertisements before enactment of New York City's Smokefree Air Act continued to include the unsubstantiated Beverly Hills claim: *"What if they passed a law that took away 30% of your business?"* [340] And the Smokefree Air Act public hearing saw the repetition of claims from the discredited Bellflower survey as well.[341]

That the discrediting of tobacco industry claims has hurt industry credibility is acknowledged even by Philip Morris, which has privately admitted that *"our dire predictions in the past rarely came true" (Philip Morris).*[342]

The New York City hearings also discredited the front organizations secretly being used by the tobacco industry to oppose the Smokefree Air Act. Full-page advertisements placed in *The New York Times* by the United Restaurant Hotel Tavern Association (URHTA) were later found to have been paid for by the Tobacco Institute and radio spots were paid for by Philip Morris' own advertising agency. Although the URHTA claimed to have 500 New York City members and to have been in existence for 60 years, it actually had no functioning chapter in any New York City borough, was unknown to New York City restaurateurs and was essentially a fictional organization.[343]

Similarly in Vermont the "Vermont Business and Restaurant Coalition had been created by the tobacco industry specifically to fight smoking restrictions in that state, and the "accommodation program" was revealed to be a "front for the tobacco industry."[344]

However the most important industry claims to assess are those relating to the scientific evidence on the health effects of second-hand tobacco smoke. Industry denials of the health hazards of environmental tobacco smoke have at this point in history been thoroughly discredited by every reputable scientific academy, government agency and medical research establishment that has investigated the subject (See Part I for partial list of 12 leading official scientific bodies, and see Part II for assessment of the medical evidence.)

## 9.1 The IARC Study

Without a doubt, the most concerted industry effort to undermine the scientific consensus on the health hazards of ETS was that related to the 12-centre, seven-country European study conducted in the 1990s by the International Agency for Research on Cancer in Lyon, France, the cancer research branch of the World Health Organization. The ten-year study was the largest European epidemiological study on lung cancer and second-hand smoke ever undertaken.

Tobacco industry strategies to undermine that study have already been noted in the industry's own words. Philip Morris, in particular, feared that the study would lead to increased smoking restrictions in Europe so it led the industry in an elaborate campaign to critique the IARC's science, manipulate the media, and prevent the results being turned into smoke ba ıs. While the IARC spent $2 million over 10 years on the study, Philip Morris planned to spend $2 million in one year alone on anti-AIRC activities alone and up to $4 million on research.[345]

The IARC study demonstrated a 16% increase in lung cancer risk for non-smokers spouses of smokers and a 17% increase in lung cancer risk for non-smokers exposed to workplace ETS, -- results that are consistent with several earlier studies. The October, 1998, issue of the *Journal of the National Cancer Institute* published the study and noted in an editorial that it reinforced *"an inescapable scientific conclusion...that ETS is a low-level lung carcinogen."*[346]

But before the study was officially released, on March 8, 1998, the London *Sunday Telegraph* reported that WHO was withholding the study because it not only failed to show that passive smoking caused lung cancer, but indicated that it could even have a protective effect. The newspaper reported that the *"astounding results are set to throw wide open the debate on passive smoking health risks...(and) are certain to be an embarrassment to the WHO."*[347] The news

report quickly spread around the world with stories from Australia to the USA to Brazil to Zimbabwe.[348]

British American Tobacco (BAT), was suspected of fuelling the story.[349] According to Dr. Chris Proctor, head of science for BAT Industries:

> *"It confirms what we and many other scientists have long believed, that while smoking in public may be annoying to some non-smokers, the science does not show that being around a smoker is a lung-cancer risk.... If this study cannot find any statistically valid risk you have to ask if there can be any risk at all."*[350]

The day after the media reports, the World Health Organization issued a strong statement, entitled: *"Passive Smoking Does Cause Lung Cancer, Do Not Let Them Fool You."* The statement pointed out that the study results were not being withheld but, according to accepted scientific practice, had been sent to a reputable scientific journal for peer review before publication.

> *"The results of this study, which have been completely misrepresented in recent news reports, are very much in line with the results of similar studies both in Europe and elsewhere:* ***passive smoking causes lung cancer in non-smokers****...."*[351]

How could there be such different interpretations of the same study? The University of Minnesota tobacco industry archives reveal that the media campaign was part of a detailed long-term strategy to conduct *"journalist briefings prior to the release of the study,"* and to *"assemble a crisis communications team/plan to manage the impact of the release of the study."*[352]

But the entire industry case and its presentation to the media rested on a complete misuse and misinterpretation of "confidence intervals" in statistical analysis. Confidence intervals are a function of sample size, because smaller samples produce a larger possible margin of error when study results are extrapolated to the population at large. The 16% increased risk of lung cancer for spouses of smokers detected in the IARC study had a confidence interval of 0.93-1.44, and the 17% increased risk for workplace ETS exposure had a confidence interval of 0.94-1.45.[353]

This simply means that the sample size was not large enough to claim "statistical significance," a technical term that refers to any confidence interval whose lower limit is not more than 1.0. In other words, because of the limited sample size (650 patients with lung cancer and 1,542 control subjects), the actual lung cancer risk for the population at large could be as low as 93% or 94% of the risk for non-exposed non-smokers or as high as 144% or 145% of the risk. The estimate of a 16% or 17% higher risk, based on actual study results, falls in between those lower and upper bounds.

While it is technically correct to say that the IARC study results "did not reach statistical significance," it is completely misleading to focus the entire discussion on the *lower* bound of the confidence interval, while completely ignoring the *upper* end. In other words, the risk of lung

cancer could as likely be 45% higher for non-smokers exposed to workplace ETS as it could be 7% lower.

The real problem is the width of the gap, which is due to insufficient sample size. According to Ong and Glantz:

> *"The industry has represented the fact that the increase in risk observed did not reach statistical significance as indicating that the study did not find any increased risk."*[354]

This is a complete misuse of the study results, which *did* find an "increased risk" of a magnitude comparable to previous studies. To reach statistical significance, a larger sample size would have been required to reduce the confidence interval. Remarkably, due to the selective manipulation of the data, the *Sunday Telegraph* and its spin-off stories never mentioned the actual study findings of a 16-17% higher risk of lung cancer for non-smokers regularly exposed to ETS.

Indeed, in accordance with the precautionary principle described in Part I, Ong and Glantz note that public policy requires a focus on the upper rather than the lower limit of a confidence interval:

> *"In environmental and health and safety regulation, it is common to take the health-protective approach of basing public policy on the upper 95% confidence limit (1.44 and 1.45 for the IARC study.)"*[355]

British American Tobacco's misrepresentation of the IARC results as showing 'no risk' follows previous industry attempts to manipulate statistical significance findings. An earlier American Cancer Society paper had reported a 27% higher risk of lung cancer for non-smokers exposed to second-hand smoke (95% CI, 0.85-1.89)[356]. The U.S. Tobacco Institute again focused on the lower bound of the confidence interval and ran major newspaper advertisements claiming the study showed that passive smoking had an "insignificant" effect on lung cancer in non-smokers.

The study author protested that the tobacco industry had distorted his results. Nevertheless, the Tobacco Institute of Australia ran a similar advertisement in 1986, and was successfully sued by the Australian Federation of Consumer Organisations on the grounds that the advertisement was false and misleading.[357] From their analysis of tobacco industry strategies, Ong and Glantz conclude:

> *"The documents and interviews suggest that the tobacco industry continues to conduct a sophisticated campaign against conclusions that second-hand smoke causes lung cancer and other diseases, subverting normal scientific processes."*[358]

## 9.2 Industry Use of Scientific and Medical Journals

An extensive analysis of 106 review articles on the health effects of passive smoking was published in the *Journal of the American Medical Association* in May 1998 in order to assess why these articles reach different conclusions.

The analysis found 39 articles out of the 106 (37%) that did not find passive smoking to be harmful to health. The remaining 67 articles (73%) concluded that passive smoking is harmful to health. Of the 39 articles that did not find a link between passive smoking and disease, 29 (or 74%) were found to be written by authors with tobacco industry affiliations. Of the remaining 10 review articles, seven found the evidence to be inconclusive or to have study design problems, and two had authors with "some" tobacco industry affiliation (they had participated in one industry symposium).

Tobacco industry affiliation was defined strictly as having received tobacco industry funding, having made statements for the tobacco industry, or having participated in at least two tobacco industry-sponsored symposia. Only one article out of the 106 concluded that passive smoking was not harmful to health *and* was written by an author without known tobacco industry affiliation. [359]

The authors conducted multiple logistic regression analyses controlling for article quality, peer review status, article topic and year of publication, and found that the *only* factor associated with concluding that passive smoking is not harmful to health was whether an author was affiliated with the tobacco industry. [360]

Similarly, when the analysis was limited to higher quality articles (scored objectively by independent assessors), tobacco industry affiliation remained the *only* factor associated with concluding that passive smoking is not harmful. When the analysis was restricted to peer-reviewed articles, the conclusion was the same: tobacco industry affiliation was the *only* factor associated with concluding that passive smoking is not harmful.

> *"No matter how we analyzed the data, tobacco industry affiliation was the only factor associated with concluding that passive smoking is not harmful to health in the multivariate analyses."* [361]

The authors concluded:

> *"These findings suggest that the tobacco industry may be attempting to influence scientific opinion by flooding the scientific literature with large numbers of review articles supporting its position that passive smoking is not harmful to health.*
>
> *This conclusion is consistent with the industry's previous strategies related to tobacco. For example, internal documents have shown that one of the tobacco industry's key strategies has been to suggest that there is doubt or controversy*

*about scientific knowledge related to the health effects of tobacco. In this way the industry is able to argue that government regulations are not warranted....*

*....(T)he conclusions of a review article may be suspect whenever the author has a financial interest in the outcome of the review. Therefore, our findings suggest that the authors of review articles should disclose their affiliations, sources of funding, and other potential financial conflicts of interest, and that the readers of review articles should consider these disclosures when deciding how to judge an article's conclusions."*[362]

In sum, objective assessments of the tobacco industry's claims that smoke bans harm industry, that passive smoking does not imperil health, and that third party representatives of tobacco industry views on these subjects are independent, have been proven false in numerous analyses. Although tobacco industry claims have been discredited on all these counts, there is no indication that the industry is any less determined to prevent smoking restrictions than in earlier periods when the evidence was less conclusive.

## 10. What Enables Smoke-Free Legislation to Succeed?

Two detailed analyses in the *Journal of the American Medical Association* have carefully analyzed numerous case studies in California to assess which factors determine the success or failure of efforts to enact smoke-free ordinances. The analyses used published reports, public documents, interviews, and attendance at public meetings.

The analyses found that public knowledge of tobacco industry involvement increases support for legislation controlling smoking. A Tobacco Institute survey found that knowledge of industry opposition to a no-smoking ordinance would increase support for the ordinance among 45% of respondents. Because of low public credibility, the tobacco industry has gone to great lengths to use front groups to conceal its own involvement.[363]

In particular, the tobacco industry worked through groups like the California Business and Restaurant Alliance (CBRA), the Sacramento Restaurant and Merchant Association (SRMA), Restaurants for a Sensible and Voluntary Policy (RSVP), and "grass-roots" smokers organizations. The industry also organized and completely funded Californians for Fair Business Policy (CFBP) as a statewide political action committee established specifically to organize and finance referenda campaigns for the tobacco industry. In Los Angeles, Beverly Hills and other jurisdictions, no restaurant trade organization existed prior to the introduction of smoke-free ordinances.[364]

The industry spent huge sums to get out the "No" vote in tobacco control referenda, offered weaker legislation that would not seriously impact tobacco consumption, and used professional public relations firms to organize opposition to smoke-free legislation.[365]

The particular vulnerability of the hospitality industry to tobacco industry manipulation has been emphasized in a recent analysis for the Ontario Minister of Health:

> *"Evidence from tobacco industry documents now on the public record proves the existence of an extensive industry campaign to undermine the scientific consensus on the health risks of second-hand smoke. A particular target of this campaign has been the hospitality industry, whose representatives have (often unwittingly) repeated tobacco industry arguments against second-hand smoke controls in their establishments."*[366]

Despite the intense and often sophisticated industry efforts on many fronts, however, the researchers found one determining factor that ensured the success of smoke-free legislation in many California cities and towns:

> *"Despite the tobacco industry's superior financial resources, the outcome of proposed local tobacco control legislation appears to depend on how seriously the health advocates mobilize in support of the local legislation. When the health community makes a serious commitment of time and resources, it wins. When it fails to make such a commitment, the tobacco industry prevails, more by default than by its superior financial resources."*[367]

That conclusion appears to be confirmed by the recent passage of a smoke-free bylaw by the Cape Breton Regional Municipality. In that case, too, a determined and unceasing effort by 200 area doctors appeared to be instrumental in ensuring the bylaw's enactment. Despite the clear health and economic benefits of smoke-free workplace legislation described in this study, past evidence indicates both that the tobacco industry will resist the legislation and that the active mobilization of the Nova Scotia health community is the best strategy to ensure the Act's passage.

# ENDNOTES

[1] Ibid., page 47.
[2] Ibid., page 46.
[3] Statistics Canada, *Canadian Tobacco Use Monitoring Survey*, February – December, 2000, Table 3: "Smoking status and average number of cigarettes smoked per day, by province, sex and age group for Canadians age 15 and over," personal communication from Anne Zaborski, Health Canada, Tobacco Control Programme, 30 May, 2001.
[4] Nova Scotia Department of Health and Heart Health Nova Scotia (1996), *The Nova Scotia Health Survey, 1995*, Communications Nova Scotia, pages 28-29; Health Canada (1999), "Smoking Behaviour of Canadians: Cycle 2, 1996/97": Fact Sheet 1.9: "Exposure to Environmental Tobacco Smoke," *National Population Health Survey Highlights*, January, 1999, no. 1.
[5] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices*, Toronto, May, 2001, page 34.
[6] The Conference Board of Canada, *The Economics of Smoke-Free Restaurants*, March, 1996, prepared by the Canadian Tourism Research Institute and the Custom Economic Services Group, pages 1 and 35.
[7] Warner, Kenneth, University of Michigan, (2000), "The economics of tobacco: myths and realities," *Tobacco Control* 9: 78-89.
[8] Steinfeld, Jesse L. (1972), "The public's responsibility: A bill of rights for the non-smoker," *Rhode Island Medical Journal* 55, 124-126, cited in Burns, David M. (1992), "Environmental Tobacco Smoke: The Price of Scientific Certainty," *Journal of the National Cancer Institute*, 84 (18): 1387-1388, September 16, 1992.
[9] Hackshaw, A. K., Law, M.R., and Wald, N.J., (1997) "The accumulated evidence on lung cancer and environmental tobacco smoke," *British Medical Journal*, 315: 980-988, October 18, 1997, footnotes 1-4; and Burns, op. cit., footnotes 1-5, American College of Occupational and Environmental Medicine, Position Statement, July 30, 2000, available at http://www.acoem.org/paprguid/papers/etspaper.htm; National Toxicology Program, *Ninth Annual Report on Carcinogens*, available at http://ehis.niehs.nih.gov/roc/ninth/known/ets.pdf.; the conclusions of six of these major scientific reviews are summarized in Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices*, May, 2001, pages 1-20.
[10] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices*, May, 2001, page 4.
[11] Ibid., page 1.
[12] Nova Scotia Department of Health and Heart Health Nova Scotia (1996), *The Nova Scotia Health Survey, 1995*, Communications Nova Scotia, pages 28-29
[13] Burns, op. cit., page 1387.
[14] Lee, P.N., (1992), *Environmental Tobacco Smoke and Mortality*, Karger, Basel (Switzerland), pages xix, 167, 209.
[15] Barnes, Deborah, and Bero, Lisa, (1998), "Why Review Articles on the Health Effects of Passive Smoking Reach Different Conclusions," *Journal of the American Medical Association*, 279 (19): 1566-1570, May 20, 1998.
[16] Victoria Macdonald, "Passive Smoking Doesn't Cause Cancer – Official," *Electronic Telegraph*, March 8, 1998.
[17] Boffetta, P. (and 24 other co-authors), International Agency for Research on Cancer, (1998), "Multicenter case-control study of exposure to environmental tobacco smoke and lung cancer inn Europe," *Journal of the National Cancer Institute*, 90: 1440-1450, Oxford University Press.
[18] For a detailed account of tobacco industry misuse of the IARC study, see Ong, Elisa and Glantz, Stanton, (2000), "Tobacco Industry efforts subverting International Agency for Research on Cancer's second-hand smoke study," *The Lancet*, 355: 1253-1259, April 8, 2000.
[19] World Health Organization, Press Release WHO/29, "Passive Smoking Does Cause Lung Cancer, Do Not Let Them Fool You," 9 March, 1998, available at http://www.who.int/inf-pr-1998/en/pr98-29.html.
[20] This discussion is based on Glantz, Stanton and Parmley, William, (1991), "Passive Smoking and Heart Disease: Epidemiology, Physiology, and Biochemistry," in Clinical Progress Series, *Circulation* 83 (1), January, 1991.
[21] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices*, Toronto, May, 2001, page 37; Hasbach, Ann, (1998), "Is Your Workplace a Threat to Your Health?", *Consulting-Specifying Engineer*, Denver, supplement on workplace protection, pages 28-33; Smoke-Free Kings (2000), *Smoke-Free By-laws: Questions and Answers*, October, 2000.

[22] For summaries of health risks due to second-hand smoke, see Health Canada, *Statistical Report on the Health of Canadians*, page 65; United States Environmental Protection Agency (1993 and 1994), *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*, National Institutes of Health, National Cancer Institute, Smoking and Tobacco Control Mongraph 4 (NIH publication 93-3605), Bethesda, Maryland, August, 1993, and "Setting the Record Straight: Secondhand Smoke is a Preventable Health Risk," EPA publication no. 402-F-94-005, June, 1994; Nova Scotia Department of Health, *Smoke-Free Places: Towards Healthier Communities in Nova Scotia: A Discussion Paper*, 1997; National Research Council, Committee on Passive Smoking, Board on Environmental Studies and Toxicology, *Environmental Tobacco Smoke: Measuring Exposures and Assessing Health Effects*, National Academy Press, Washington D.C., 1986. Health Canada, "Passive Smoking: Nowhere to Hide," available at http://www.hc-sc.gc.ca/hppb/tobaccoreduction/factsheets/passive.htm. For a comprehensive set of references, see footnotes 106-124 in Report to the Minister of Health from Expert Panel on the Renewal of the Ontario Tobacco Strategy, *Actions Will Speak Louder than Words*, February, 1999.

[23] Hyland, Andrew, and Cummings, Michael, (1999), "Consumer Response to the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5(1): 28-36, January, 1999, page 28, citing US Environmental Protection Agency, (1992), *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*, Publication no. EPA 600/6-90/006F, Washington DC.

[24] Heart and Stroke Foundation of Canada, (1994), *Environmental Tobacco Smoke: Behind the Smokescreen*, Ottawa.

[25] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices*, Toronto, May, 2001, pages v and vi.

[26] This estimate is based on several U.S. and international studies, including: U.S. Centers for Disease Control and Prevention, "State-Specific Prevalence of Current Cigarette Smoking Among Adults and the Proportion of Adults Who Work in a Smoke-Free Environment – United States, 1999," *Morbidity and Mortality Weekly Report* (2000) 49 (43): 978-982, November 3, 2000, page 978, citing Centers for Disease Control, "Smoking-attributable mortality and years of potential life lost – United States, 1984," *Morbidity and Mortality Weekly Report* (1997): 46: 444-451 (3,000 estimated US deaths due to lung cancer), and National Cancer Institute (1999), *Health effects of exposure to environmental tobacco smoke: the report of the California Environmental Protection Agency*, Bethesda, Maryland, U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, NIH publication no. 99-4645 (62,000 US coronary heart disease deaths annually among non-smokers exposed to ETS); also published as California Environmental Protection Agency (1997), *Health Effects of Exposure to Environmental Tobacco Smoke*, Office of Environmental Health Hazard Assessment, September, 1997, available at: http://www.oehha.org/air/environmental_tobacco/index.html, (360 annual lung cancer deaths and 4,200-7,440 annual ischaemic heart disease deaths due to ETS exposure in California, plus 120 annual sudden infant death syndrome deaths due to ETS). See also mortality estimates due to ETS in Glantz, Stanton, and Parmley, William (1991), "Passive Smoking and Heart Disease: Epidemiology, Physiology, and Biochemistry," *Circulation* 83 (1): 1-12, January, 1991; Glantz, Stanton and Parmley, William, (1995), "Passive Smoking and Heart Disease: Mechanisms and Risk," *Journal of the American Medical Association* 273 (13): 1047-1053, April 5, 1995 (both articles estimate a total of 53,000 US deaths due to passive smoking, including 37,000 from heart disease, 3,700 from lung cancer, and 12,000 from other cancers); Wells, A. (1988), "An estimate of adult mortality in the United States from passive smoking," cited in Glantz and Parmley (1991) op. cit., and Kawachi I., Pearce N., and Jackson R.,(1989), "Deaths from lung cancer and aschaemic heart disease due to passive smoking in New Zealand," *New Zealand Medical Journal* 102: 337-340.

[27] Estimates are based on U.S. and New Zealand studies. See U.S. Environmental Protection Agency, op. cit.; Glantz and Parmley, op. cit., page 4; Kawachi I., Pearce N., and Jackson R.,(1989), "Deaths from lung cancer and aschaemic heart disease due to passive smoking in New Zealand," *New Zealand Medical Journal* 102: 337-340; Gold, Mark, MD, (1995), *Tobacco*, volume 4 of *Drugs of Abuse: A Comprehensive Series for Clinicians*, Plenum Medical Book Company, New York and London, page 69; US National Cancer Institute, *I Mind Very Much If You Smoke*, June, 1993. For active smoking deaths, see Colman, Ronald, *The Cost of Tobacco in Nova Scotia*, Cancer Care Nova Scotia and GPI Atlantic, Sydney, NS, October, 2000. For obesity deaths, see Colman, Ronald, *The Cost of Obesity in Nova Scotia*, Cancer Care Nova Scotia and GPI Atlantic, Halifax, March, 2000. For alcohol-related deaths, see Single, Eric, et. al., *The Costs of Substance Abuse in Canada*, Canadian Centre on Substance Abuse, Ottawa, 1992, Table 10.

[28] Picard, Andre, "Cigarettes worst risk at work, study says," The Globe and Mail, 18 August, 2001, page A6.

[29] Nova Scotia Department of Health and Heart Health Nova Scotia (1996), *The Nova Scotia Health Survey, 1995,* Communications Nova Scotia, pages 28-29.

[30] US Environmental Protection Agency, (1993), op. cit., California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, (1997), *Health Effects of Exposure to Environmental Tobacco Smoke,* Sacramento; Report to the Minister of Health from Expert Panel on the Renewal of the Ontario Tobacco Strategy. (1999), op. cit., Mitchell, E.A. et. al., (1993), "Smoking and sudden infant death syndrome," *Pediatrics* 91: 1893-1896; Cohen-Klonoff, H.S., et. al., "The effect of passive smoking and tobacco exposure through breast milk on sudden infant death syndrome," (1995), *Journal of the American Medical Association* 273: 795-798; Lister, Susan and Jorm, Louisa, (1998), "Parental smoking and respiratory illnesses in Australian children aged 0-4 years: ABS 1989-90 National Health Survey results, *Australian and New Zealand Journal of Public Health,* 22: 781-786, Canberra, December, 1998.

[31] Stockwell, H.G. et. al., (1992), "Environmental tobacco smoke and lunch cancer risk in nonsmoking women," *Journal of the National Cancer Institute* 84: 1417-1422; Fontham, E.T., et. al., (1994), "Environmental tobacco smoke and lung cancer in nonsmoking women: A multicenter study," *Journal of the American Medical Association* 271: 1752-1759; Hackshaw et. al., op. cit., Kawachi, I., et. al., (1997), "A prospective study of passive smoking and coronary heart disease," *Circulation* 95: 2374-2379; Law, M.R., et. al., (1997), "Environmental tobacco smoke exposure and ischaemic heart disease: an evaluation of the evidence," *British Medical Journal* 315: 973-980.

[32] American College of Occupational and Environmental Medicine (ACOEM), (2000), *Epidemiological Basis for an Occupational and Environmental Policy on Environmental Tobacco Smoke,* July 30, 2000, available at http://www.acoem.org/paprguid/papers/etspaper.htm; Boffetta et. al. (1998), op. cit., Wells, A.J., (1998), "Heart disease from passive smoking in the workplace," *Journal of the American College of Cardiology* 31: 1-9; Hammond, S.K., et. al., (1995), "Occupational exposure to environmental tobacco smoke," *Journal of the American Medical Association* 274: 956-960; Thompson B. et. al., (1995), "ETS expsoure in the workplace," *Journal of Occupational and Environmental Medicine* 37: 1086-1092; Mannino, D.M., (1997), "Environmental tobacco smoke exposure in the home and worksite and health effects in adults: Results from the 1991 National Health Survey," *Tobacco Control* 6: 296-305; Repace, J.L., et. al., (1980), "Indoor air pollution, tobacco smoke and public health," *Science,* 208: 464-472; Eisner, Mark, et. al., (1998), "Bartenders' Respiratory Health After Establishment of Smoke-Free Bars and Taverns," *Journal of the American Medical Association,* 280 (22): 1909-1914, December 9, 1998; Siegel, Michael (1993), "Involuntary Smoking in the Restaurant Workplace: A Review of Employee Exposure and Health Effects," *Journal of the American Medical Association,* 270 (4), July 28, 1993; Dimich-Ward H., et. al., (1997), "Analysis of nicotine and cotinine in the hair of hospitality workers exposed to environmental tobacco smoke," *Journal of Occupational and Environmental Medicine* 39: 946-948.

[33] Biologic monitoring of exposure to ETS is most commonly conducted by measuring cotinine in the serum and/or urine. Cotinine, the major metabolite of nicotine, has a half-life of 16-20 hours, and therefore reflects exposure to nicotine from the previous one to two days. (Trout D., et. al., (1998), "Exposure of casino employees to environmental tobacco smoke," *Journal of Occupational and Environmental Medicine* 40: 270-276, page 271.) There are no other significant sources of cotinine aside from tobacco smoke, and so it is regarded as a reliable indicator of ETS exposure in non-smokers.

[34] Trout D., et. al., (1998), "Exposure of casino employees to environmental tobacco smoke," *Journal of Occupational and Environmental Medicine* 40: 270-276; study conducted for the Division of Surveillance, Hazard Evaluation and Field Studies, U.S. National Institute for Occupational Safety and Health. On excess ETS exposure of food service employees, see Gerlach, K., et. al., (1997), "Workplace smoking policies in the United States: results from a national survey of over 100,000 workers," cited in Glantz, Stanton and Smith, Lisa, (1997) "The Effect of Ordinances Requiring Smoke-Free Restaurants and Bars on revenues: A Follow-Up," *American journal of Public Health* 87 (10): 1687-1693), footnote 19, pages 1692-1693.

[35] Siegel, Michael, (1993), "Involuntary Smoking in the Restaurant Workplace: A Review of Employee Exposure and Health Effects," *Journal of the American Medical Association* 270 (4), July 28, 1993; Trout, D., op. cit.; Eisner (1998), op. cit.

[36] Siegel, op. cit., page 490.

[37] Siegel, op. cit., page 493.

[38] Health Canada, *The Economics of Workplace Smoking Restrictions,* available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk05.htm.

[39] Hackshaw, et. al., op. cit.

[40] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 7.

[41] Wells, A.J., "Lung cancer from passive smoking at work," (1998), *American Journal of Public Health* 88: 1025-1029; ACOEM, (2000), op. cit., page 3. The 12-centre case control study of lung cancer and ETS in seven European countries found an excess risk of 16% for exposure to spousal ETS, and 17% for exposure to workplace ETS (Boffetta, et. al., 1998, op. cit.)

[42] Siegel, op. cit., page 490; Dimich-Ward, H., et. al., (1988), "Occupational Mortality among Bartenders and Waiters," Canadian Journal of Public Health 79: 194-197; Hyland, Andrew, and Cummings, Michael, (1999), "Consumer Response to the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 28-36, January, 1999, footnotes 4-11, page 35.

[43] Hackshaw et. al., op. cit.

[44] Heart and Stroke Foundation of Canada, (1994), *Environmental Tobacco Smoke: Behind the Smokescreen,* Ottawa.

[45] Kreuzer, M., et. al. (2000), "Environmental tobacco smoke and lung cancer: a case-control study in Germany," *American Journal of Epidemiology* 151: 241-250; ACOEM, op. cit., page 3.

[46] Hackshaw, et. al., op. cit.

[47] Idem.

[48] United States Environmental Protection Agency (1992), *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders,* Office of Research and Development, EPA/600/6-90/006F, December, 1992 cited in Ontario Tobacco Control Unit, University of Toronto, *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001.

[49] U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program (2000), *Ninth Report on Carcinogens,* Washington, DC, available at: http://ehis.niehs.nih.gov/roc/ninth/known/ets.pdf.

[50] Ontario Tobacco Control Unit, University of Toronto, *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 20.

[51] Ibid., page 8.

[52] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 37.

[53] Glantz and Parmley, op. cit.

[54] Hecht, Stephen, (1994), "Environmental Tobacco Smoke and Lung Cancer: the Emerging Role of Carcinogen Biomarkers and Molecular Epidemiology," *Journal of the National Cancer Institute,* 86 (18), September 21, 1994, page 1369; Crawford, F.G., et. al., "Biomarkers of environmental tobacco smoke in preschool children and their mothers," *Journal of the National Cancer Institute* 86: 1398-1402.

[55] Idem.; Hackshaw, et. al., op. cit., Mclure, M., et. al., (1989), "Elevated blood levels of carcinogens in passive smokers," *American Journal of Public Health* 79: 1381-1384; Hecht, S., et. al., (1993), "A tobacco-specific lung carcinogen in the urine of men exposed to cigarette smoke," *New England Journal of Medicine* 329: 1543-1546; Bartsch H., et. al., (1990), "Carcinogen haemoglobin adducts, urinary mutagenicity and metabolic phenotype in active and passive cigarette smokers," *Journal of the National Cancer Institute* 82: 1826-1831; Crawford, et. al., op. cit.

[56] Hammond, S.K., et. al., (1993), "Relationship between environmental tobacco smoke exposure and carcinogen-hemoglobin adduct levels in nonsmokers," *Journal of the National Cancer Institute* 85: 474-478.

[57] Idem.

[58] National Cancer Institute Monograph #10, *Health Effects of Exposure to Environmental Tobacco Smoke: the report of the California Environmental Protection Agency,* cited in ACOEM (2000), op. cit., and available at http://rex.nci.nih.gov/nic_monographs/index.htm.

[59] Ontario Tobacco Control Unit, University of Toronto, *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, pages 12-13.

[60] Glantz and Parmley, op cit., page 4.

[61] US Public Health Service (1983), *The Health Consequences of Smoking: Cardiovascular Disease: A Report of the Surgeon-General,* US Department of Health and Human Services 84-50202.

[62] US Public Health Service, (1986), *The Health Consequences of Involuntary Smoking: A Report of the Surgeon-General,* Centers for Disease Control #87-8398; National Research Council, (1986), *Environmental Tobacco Smoke: Measuring Exposure and Assessing Health Effects,* National Academy Press, Washington D.C.

[63] Steenland, Kyle, (1992), "Passive Smoking and the Risk of Heart Disease," *Journal of the American Medical Association,* 267 (1): 94-99, January 1, 1992; Glantz, Stanton and Parmley, William, (1995), "Passive Smoking and Heart Disease: Mechanisms and Risk," *Journal of the American Medical Association,* 273 (13), April 5, 1995; Glantz, Stanton, and Parmley, William, (1991), "Passive Smoking and Heart Disease: Epidemiology, Physiology,

and Biochemistry," *Circulation* 83 (1), January, 1991, Clinical Progress Series, pages 1-12; Kawachi, I. et. al., (1997), "A Prospective Study Of Passive Smoking And Coronary Heart Disease," *Circulation* 95: 2374-2379; Law, M.R. et. al., (1997), "Environmental tobacco smoke exposure and ischaemic heart disease: an evaluation of the evidence," *British Medical Journal* 315: 973-980; Humble, C. et. al., (1990), "Passive Smoking and 20-year cardiovascular mortality among non-smoking wives, Evans County, Georgia, *American Journal of Public Health,* 80: 599-601; Howard, G., et. al., (1998), "Cigarette Smoking and Progression of Atherosclerosis: The Artherosclerosis in Communities (ARIC) Study," *Journal of the American Medical Association* 279: 119-124; Wells, A. J., (1994), "Passive Smoking as a Cause of Heart Disease," *Journal of the American College of Cardiology* 24: 546-554; Wells, A. J., (1998), :Heart Disease from Passive Smoking in the Workplace," *Journal of the American College of Cardiology* 31: 1-9; National Clearinghouse on Tobacco and Health (1995), The Health Effects of Tobacco Use," cited in Nova Scotia Department of Health, *Towards Healthier Communities in Nova Scotia: A Discussion Paper,* available at http://www.gov.ns.ca/health/smoke_free/default.htm.

[64] Glantz and Parmley (1991), op. cit, pages 2-3; Steenland, op. cit., page 95; Humble C., (1990), op. cit., Hole, D., et. al., (19889), "passive smoking and cardiorespiratory health in a general population in the west of Scotland," *British Medical Journal* 299: 423-427; Helsing, K., et. al., (1988), "Heart disease mortality in nonsmokers living with smokers," *American Journal of Epidemiology,* 127: 915-922.

[65] Law, et. al., (1997), op. cit., and study report in *Times of London,* 17 October, 1997.

[66] ACOEM, op. cit., page 3; He Y., et. al., (1994), "Passive smoking at work as a risk factor for coronary heart disease in Chinese women how have never smoked," *British Medical Journal* 308: 380-384; Wells, A.J., (1998), "Heart disease from passive smoking in the workplace," *Journal of the American College of Cardiology* 31: 1-9.

[67] Taylor, A.E., et. al., (1992), "Environmental tobacco smoke and cardiovascular disease: a position paper from the Council on Cardiopulmonary and Critical Care, American Heart Association, *Circulation* 86: 1-4; Glantz and Parmley (1995), op. cit., page 1047.

[68] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, page 4.

[69] Glantz and Parmley, (1995), op. cit., pages 1050, 1051.

[70] Idem.

[71] Nova Scotia Department of Health, (1997), *Smoke-Free Places: Towards Healthier Communities in Nova Scotia, A Discussion Paper,* page 2.

[72] Idem., page 1047.

[73] Idem., page 1048; Gold, Mark MD, (1995), *Tobacco,* Volume 4 in *Drugs of Abuse: A Comprehensive Series for Clinicians,* Plenum Medical Book Company, New York, page 69.

[74] Idem., page 1049 and Steenland, op. cit., page 96.

[75] National Research Council, (1986), *Environmental Tobacco Smoke: Measuring Exposures and Assessing Health Effects,* National Academy Press, Washington, DC; U.S. Department of Health and Human Services, (1986), *The Health Consequences of Involuntary Smoking: A Report of the Surgeon-General,* Rockville, Maryland; Collishaw, Neil, et. al., (1984), "Tobacco Smoke in the Workplace: An Occupational Health Hazard," *Canadian Medical Association Journal* 131 (10): 1199-1204.

[76] International Program on Chemical Safety, World Health Organization, *Environmental Health Criteria 211: Health Effects of Interactions between Tobacco Use and Exposure to other Agents,* World Health Organization, Geneva, 1999, page 5.

[77] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 38.

[78] Steenland, op. cit., page 95; Glantz and Parmley (1995), op. cit., page 1047.

[79] Robert Langreth (1998), "New Smoking Study Likely to Have Broad Impact," *Wall Street Journal,* New York, January 15, 1998; Gold, op. cit., page 69.

[80] Steenland, op. cit., page 99; Glantz and Parmley (1995), op. cit., pages 1050, 1051.

[81] Steenland, op. cit., page 94.

[82] A Report to the Minister of Health from her Expert Panel on the Renewal of the Ontario Tobacco Strategy (February 1999), op. cit., page 22.

[83] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, page 12, citing You, R. Z., et. al., (1999), "Ischaemic stroke risk and passive exposure to spouse' cigarette smoking," *American Journal of Public Health* 89: 572-575; Bonita, R., et. al., (1999), "Passive smoking as well as active smoking increases the risk of acute stroke," *Tobacco Control* 8: 156-160.

[84] Nuorti, J.P. et. al., (2000), "Cigarette smoking and invasive pneumococcal disease," *New England Journal of Medicine* 342: 681-689; Sheffield, J.V. and Root, R.K., (2000), "Smoking and pneumococcal infection," 342: 732-734; ACOEM (2000), op. cit., page 2, and also page 3 and page 7 (footnotes 23 and 24), citing Jindal, S.K., et. al., (1994), "Indices of morbidity in adult patients exposed to environmental tobacco smoke," *Chest.* 106: 746-749 and White, J.R., et. al., (1991), "Respiratory illness in non-smokers chronically exposed to tobacco smoke in the workplace," *Chest.* 100: 39-43; Eisner, M. et. al., (1998), "Environmental tobacco smoke and adult asthma: The impact of changing exposure status on health outcomes," *American Journal of Respiratory and Critical Care Medicine* 158: 127-133, cited in *A Report to the Minister of Health from her Expert Panel on the renewal of the Ontario Tobacco Strategy* (February 1999), op. cit., pages 22 and 44; Greer, J., et. al., (1993), "Asthma related to occupational and ambient air pollutants in nonsmokers, *Journal of Occupational and Environmental Medicine* 35: 909-915; Shephard, R.J., (1992), "Respiratory irritation from environmental tobacco smoke," *Archives of Environmental Health* 47 (2): 123-130; Tyler, Michele, (1998), "Blowing smoke: Do smokers have a right? Limiting the privacy rights of cigarette smokers," *Georgetown Law Journal* 86 (3): 783-811, citing references on respiratory effects of ETS (page 784).

[85] California Environmental Protection Agency, (1997), *Health Effects of Exposure to Environmental Tobacco Smoke,* Office of Environmental Health Hazard Assessment, CEPA, Sacramento.

[86] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, page 2.

[87] Eisner, Mark, et. al. (1998), "Bartenders' Respiratory Health After Establishment of Smoke-Free Bars and taverns," *Journal of the American Medical Association* 280 (22): 1909-1914, December 9, 1998.

[88] Eisner, op. cit., page 1913.

[89] Idem., pages 1909 and 1914.

[90] Oster, Gerry, Colditz, Graham, and Kelly, Nancy, (1984), *The Economic Costs of Smoking and Benefits of Quitting,* Lexington Books, D.C. Heath and Company, Lexington, Massachusetts and Toronto, pages 100-103

[91] As cited in Eisner, op. cit., page 1913, and footnotes 15, 16 and 47, page 1914.

[92] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, page 18.

[93] Ibid., page 17.

[94] World Health Organization, International Program on Chemical Safety, *Environmental Health Criteria 211: Health Effects of Interactions between Tobacco Use and Exposure to other Agents*, Geneva, 1999, page 97.

[95] Ibid., page vi and page 47.

[96] Hyland, Andrew, and Cummings, Michael, (1999), "Consumer Response to the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 28-36, page 28; Repace, J.L., (1993), "Tobacco Smoke Pollution," in *The Disease of Nicotine Addiction: Principles and Management,* Oxford University Press, New York.

[97] U.S. Surgeon-General, *The Health Consequences of Involuntary Smoking,* (1986), U.S. Department of Health and Human Services, DHHS publication no. (CDC) 87-8398, Washington, D.C.; National Research Council, (1986), *Environmental Tobacco Smoke: Measures of Exposure and Assessing Health Effects,* National Academy Press, Washington, D.C.

[98] Health Canada, *Smoking: An Air Quality Fact Sheet,* available at the Health Canada web site: www.hc-sc.gc.ca, and cited in Pacific Analytics, (2001), op. cit., page 25, footnote 38.

[99] NIOSH, (1991), *Environmental Tobacco Smoke in the Workplace,* [DHHS (NIOSH) Publication No. 1991: 91-108], Cincinnati, OH, US Department of Health and Human Services, Public Health Service, Centers for Disease Control, NIOSH.

[100] Trout, op. cit., page 275.

[101] Among the materials reviewed by the ACOEM on this issue are the Surgeon-General's report (see above); National Research Council, (1986), *Environmental Tobacco Smoke: Measures of Exposure and Assessing Health Effects,* National Academy Press, Washington D.C.; Sorenson G, et. al., (1991), "Effects of a worksite non-smoking policy: evidence for increased cessation," *American Journal of Public Health* 81: 202-3; Borland, R., et. al., (1992), "Protection from environmental tobacco smoke in California: the case for a smoke-free workplace," *Journal of the American Medical Association* 268: 749-752; Heloma, A, et. al., (2000), "Smoking and exposure to tobacco smoke at medium-sized and large-scale workplace, *American Journal of Industrial Medicine* 37: 214-220; Sorenson G., et. al., (1991), "Employee knowledge and attitudes about a worksite non-smoking policy: rational for further smoking restrictions," *Journal of Occupational Medicine* 33: 1125-1130; Thompson, B., et. al., (1995), "ETS exposure in the workplace," *Journal of Occupational Medicine* 37: 1086-1092; Brownson, R.C., et. al., (1997), "Environmental

tobacco smoke: health effects and policies to reduce exposure, " *Annual Review of Public Health* 18: 163-185; Eriksen, M.P., et. al., (1998), "A review of the health impact of smoking control at the workplace," *American Journal of Health Promotion* 13: 83-104.

[102] ACOEM, op. cit., pages 4 and 5.

[103] ACOEM, op. cit., page 5. For the economic benefits of workplace smoking cessation programs, see Warner, Kenneth, et. al., (1996), "Health and Economic Implications of a Work-Site Smoking-Cessation Program: A Simulation Analysis," *Journal of Occupational and Environmental Medicine* 38 (10): 981-992, October, 1996.

[104] Borland, Ron., et. al., (1992), "Protection from Environmental Tobacco Smoke in California: The Case for a Smoke-Free Workplace," *Journal of the American Medical Association* 268 (6): 749-752, August 12, 1992.

[105] Health Canada, *The Economics of Workplace Smoking Restrictions,* available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk05.htm.

[106] Idem.

[107] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 29; and brochure of The Hotel Association of Nova Scotia.

[108] The Hotel Association of Canada, "Courtesy of Choice Facts," advertisement giving as contact information Anthony Pollard: 613-237-7149.

[109] Hotel Association of Nova Scotia, "The Courtesy of Choice Program."

[110] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, pages 37 and 39.

[111] Smoke-Free Kings (2000), *Smoke-free By-laws: Questions and Answers,* October, 2000.

[112] Ontario Tobacco Research Unit (2001), op. cit., page vii, bold emphasis in original, and pages 21 and 29.

[113] Pacific Analytics, (2001), *The Economic Impacts of the Proposed Amendment to the ETS Regulation,* prepared for The Workers Compensation Board of British Columbia, February, 2001, page 25.

[114] Repace, J. (1994), "Risk Management of Passive Smoking at Work and Home, *Saint Louis University Public Law Review* 13 (2): 763-785; Burton, D.J., "Smoke-free work environments require proper ventilation adjustments," cited in Borland, Ron, et. al., (1992), "Protection from Environmental Tobacco Smoke in California," *Journal of the American Medical Association* 268 (6): 749-752, August 12, 1992, footnote 27, page 752.

[115] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, pages vii and 47.

[116] Trout, et. al., op. cit., pages 273-274.

[117] Price, Philip, Canadian Centre for Occupational Health and Safety (1989), *Passive Smoking: Health Effects and Workplace Resolutions,* February, 1989.

[118] "Smoking in Public Places," *ASH Fact Sheet* No. 14, October, 1999.

[119] Repace, James, (2000), *Can Ventilation Control Secondhand Smoke in the Hospitality Industry?: An Analysis of the Document "Proceedings of the Workshop on Ventilation Engineering Controls for Environmental Tobacco Smoke in the Hospitality industry," sponsored by the federal Occupational Safety and Health Administration and the American Conference of Governmental Industrial Hygienists,* June, 2000, available at: http://www.dhs.ca.gov/tobacco/documents/FedOHSHAets.pdf ; and Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 23.

[120] Ibid., page 1.

[121] Ibid., page 27.

[122] Cremieux, Pierre-Yves, and Ouellette, Pierre, (2001), "Actual and perceived impacts of tobacco regulation on restaurants and firms," *Tobacco Control* 10: 33-37, Spring, 2001

[123] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 22.

[124] Idem.

[125] Ibid., page 28

[126] Health Canada (2000), "Smoking on the Job: Trends and Issues," page 1, August, 2000, available on the Health Canada web site at: http://www.hc-sc.gc.ca/hppb/tobaccoreduction/publications/workplace/work/wplcsmk02.htm

[127] White, et. al., cited in ACOEM, op. cit., page 3.

[128] Pacific Analytics, (2001), *The Economic Impacts of the Proposed Amendment to the ETS Regulation,* prepared for The Workers Compensation Board of British Columbia, February, 2001, page 3.

[129] Statistics Canada (2001), Impact of Smoking on Life Expectancy and Disability, Cat. No. 91-209-XPE

[130] Mortality estimates based on Ellison, Larry, Mao, Yang, and Laurie Gibbons, (1995), "Projected Smoking-Attributable Mortality in Canada, 1991-2000," *Chronic Diseases in Canada,* volume 16, no. 2, Spring, 1995, Health Canada, Health Protection Branch, Laboratory Centre of Disease Control, Tables 4 and 5; and see Colman, Ronald, (2000), *The Cost of Tobacco in Nova Scotia,* Cancer Care Nova Scotia and GPI Atlantic, Sydney, October, 2000, Part Two, especially page 19.

[131] Health Canada, *The Benefits of Quitting,* available at: http://www.hc-sc.gc.ca/hppb/tobaccoreduction/factsheets/benefits.htm.

[132] Oster, op. cit., pages 96-97, citing American Cancer Society study; Peto, Richard, et. al., (2000), "Smoking, Smoking Cessation, and Lung Cancer in the UK since 1950: Combination of national statistics with two case-control studies," *British Medical Journal,* 321 (7527): 323-329, 5 August, 2000.

[133] Oster, op. cit., pages 98-100.

[134] Nova Scotia Department of Health, *Smoke-Free Places: Twoards Healthier Communities in Nova Scotia: A Discussion Paper,* pages 3-4, citing sources from the Heart and Stroke Foundation, *Journal of the American Medical Association,* and *Canadian Medical Association Journal* (footnotes 1, 2, 8, and 9, page 4).

[135] Broder, I., et. al., (1993), "Environment and well-being before and following smoking ban in office buildings," *Canadian Journal of Public Health* 84: 254-258; Millar, W. J., (1988), "Evaluation of the impact of smoking restrictions in a government work setting," *Canadian Journal of Public Health* 79: 379-382; Stillman, F.A., et. al., (1990), "Ending smoking at the Johns Hopkins medical institutions," *Journal of the American Medical Association* 264: 1565-1569; Woodruff, J.L., et. al., (1993), "Lower levels of cigarette consumption found in smoke-free workplaces in California," cited in Eisner, op. cit., pages 1913-4; Patten, C.A. et. al., (1995) "Workplace Smoking policy and changes in smoking behavior in California: a suggested association," *Tobacco Control* 4: 36-41; Moskowitz, J.M., et. al., (2000), "The impact of workplace smoking ordinances in California on smoking cessation," *American Journal of Public Health* 90: 757-761; Biener, L and Nyman, A.L., (1999), "Effect of workplace smoking policies on smoking cessation: results of a longitudinal study," *Journal of Occupational and Environmental Medicine* 41: 1121-1127; Biener, L. et. al., (1989), "A comparative evaluation of a restrictive smoking policy in a general hospital," *American Journal of Public Health* 79: 192-195; Brigham, J. et. al., (1994), "Effects of restricted work-site smoking policy on employees who smoke," *American Journal of Public Health* 84: 773-778; ACOEM, op. cit., page 4; Colman, *The Cost of Tobacco in Nova Scotia,* pages 23-24 and 72.; Wakefield, M.A., et. al., (1992), "Workplace smoking restrictions, occupational status, and reduced cigarette consumption, *JOM* 34 (7): 693-697, cited in Richmond, Robyn, et. al., (1998), "Screening for unhealthy lifestyle factors in the workplace," *Australian and New Zealand Journal of Public Health* 22 (3): 324-331; Borland, R, et. al., (1990), "Effects of workplace smoking bans on cigarette consumption," *American Journal of Public Health* 80 (2): 178-180; Borland, R. et. al. (1991), "Changes in smoking behaviour after a total workplace smoking ban," *Australian Journal of Public Health* 15 (2): 130-134.

[136] Health Canada, *Impact of Workplace Smoking Restrictions,* summarizes the results of some of these studies, and is available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk04.htm.

[137] Idem. On the cost-effectiveness of workplace smoking cessation programs, see particularly Warner, Kenneth et. al., (1996), "Health and Economic Implications of a Work-Site Smoking-Cessation Program: A Simulation Analysis," *Journal of Occupational and Environmental Medicine* 38 (10): 981-992, October, 1996; and Colman, Ronald, (2000), *The Cost of Tobacco in Nova Scotia.* GPI Atlantic, Halifax, section 14.3, pages 75-76. For case studies of the cost-effectiveness of workplace smoking cessation, see also "The high price of cigarette smoking," in *Business and Health,* August, 1997, special supplement: What Cigarettes Do To American Business."

[138] Health Canada, op. cit., page 3.

[139] Idem.

[140] Idem.

[141] Biener, L. et. al., (1989), "A Comparative evaluation of a restrictive smoking policy in a general hospital," *American Journal of Public Health* 79 (2): pages 1-4. See also Samuels, Bruce, and Glantz, Stanton, (1991), "The Politics of Local Tobacco Control," *Journal of the American Medical Association* 266 (15): 2110-2117, October 16, 1991, page 2111.

[142] Stephens, Thomas, et. al., (1997), "The Relationship of Cigarette Prices and No-Smoking Bylaws to the Prevalence of Smoking in Canada," *American Journal of Public Health* 87: 1519-1521; and Abrams, D.B., et al., (1992), "Motivational characteristics of smokers at the workplace: a public health challenge," *Preventive Medicine* 21: 679-687, cited in ACOEM, op. cit., page 4.

[143] Colman, op. cit., page 27, Table 4.

[144] Idem.

[145] Warner, D., (1994), "'We do not hire smokers': May employers discriminate against smokers?", cited in Health Canada, *The Economics of Workplace Smoking Restrictions,* available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk05.htm. For other estimates of employer costs due to smoking, see "The high price of cigarette smoking," *Business and Health,* August 1997, special supplement: "What Cigarettes Do to American Business."

[146] Price, Philip (1989), Canadian Centre for Occupational Health and Safety, *Passive Smoking: Health Effects and Workplace Resolutions,* February, 1989, citing Keifhaber, A., et. al. (1987), "Smoking: a challenge to worksite health management," in *National Conference on Smoking and Health: Developing a Blueprint for Action: Proceedings,* New York: American Cancer Society, and Weis, W.L. (1981), "Can you afford to hire smokers?", *Personnel Administrator* 26 (5): 71-78.

[147] The Conference Board of Canada, (1997), *Smoking and the Bottom Line: The Costs of Smoking in the Workplace,* Health Canada, Ottawa; The Conference Board of Canada, *Smoking Cessation Initiatives in the Workplace,* available at: http://www.hc-sc.gc.ca/hppb/tobaccoreduction/publications/workplace/bottom_line/report.htm, Helyer, Alan, and Brehm, Walter, (1998), "The Economic Consequences of Tobacco Use for the Department of Defense, 1995," *Military Medicine* 163 (4): 217-221, April, 1998. For application of these studies to Nova Scotia, see Colman, op. cit., pages 22-25.

[148] U.S. Environmental Protection Agency, *Setting the Record Straight: Second-hand Smoke is a Preventable Health Risk,* EPA publication no. 402-F-94-005, June, 1994.

[149] Rothstein, Mark (1987), "Refusing to Employ Smokers: Good Public Health or Bad Public Policy?" and Napier, Kristine, American Council on Science and Health, *Cigarettes: What the Warning Label Doesn't Tell You,"* both cited in Tyler, Michele, (1998), "Blowing smoke: Do smokers have a right? Limiting the privacy rights of cigarette smokers," *Georgetown Law Journal* 86 (3): 783-811, January, 1998.

[150] Health Canada, *Second Hand Smoke: Workplace Smoking: Trends, Issues and Strategies,* available at http://www.hc-sc.gc.ca/hppb/cessation/air/workplace_smoking/part2_regulating.html, page 1.

[151] Price Philip, (1989), *Passive Smoking: Health Effects and Workplace Resolutions,* Canadian Centre for Occupational Health and Safety, February, 1989, pages 3, 4 and 6.

[152] Health Canada, *The Economics of Workplace Smoking Restrictions,* available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk05.htm.

[153] Gibson, B. (1994), "Psychological aspects of smoker-nonsmoker interaction: Implications for public policy," *American Psychology* 49: 1081-1083.

[154] American College of Occupational and Environmental Medicine (ACOEM), (2000), *Epidemiological Basis for an Occupational and Environmental Policy on Environmental Tobacco Smoke,* July 30, 2000, available at http://www.acoem.org/paprguid/papers/etspaper.htm

[155] Health Canada, *Second Hand Smoke: Workplace Smoking: Trends, Issues and Strategies,* available at: http://www.hc-sc-gc.ca/hppb/cessation/air/workplace_smoking/part2_regulating.html.

[156] Idem.

[157] Government of Nova Scotia, (1998), *Occupational Health and Safety Act,* updated September 22, 1998, available at http://www.gov.ns.ca/legc/statutes/occph&s1.htm ; and Occupational Safety General Regulations, Part 4, section 15, effective May 1, 2000.

[158] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001.

[159] Op. cit., page iv.

[160] Tyler, Michele, (1998), "Blowing smoke: Do smokers have a right? Limiting the privacy rights of cigarette smokers," *Georgetown Law Journal,* 86 (3): 783-811, January, 1998

[161] Robin Lee Allen (1998), "Secondhand smoke signals Boston suit," *Nation's Restaurant News,* New York, March 23, 1998.

[162] Idem.

[163] *Nation's Restaurant News,* New York, May 18, 1998.

[164] Tyler, Michele, (1998), "Blowing smoke: Do smokers have a right? Limiting the privacy rights of cigarette smokers," *Georgetown Law Journal,* 86 (3): 783-811, January, 1998.

[165] U.S. Environmental Protection Agency (1994), *The Costs and Benefits of Smoking Restrictions: An Assessment of the Smoke-Free Environment Act of 1993,* Office of Radiation and Indoor Air, Washington, DC, April, 1994, cited in Health Canada, *The Economics of Workplace Smoking Restrictions,* available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk05.htm.

[166] Stephens, Thomas, et. al., (1997), "The relationship of Cigarette Prices and No-Smoking Bylaws to the Prevalence of Smoking in Canada," *American Journal of Public Health* 87 (9), September, 1997, pages 1519-1521.
[167] California Department of Health Services, Tobacco Control Section, August 2000. California Tobacco Control Update.
[168] Health Canada. CTUMS (Canadian Tobacco Use Monitoring Survey) Annual, February-December 2000.
[169] *The Sunday Herald,* Halifax, May 6, 2001, page C1.
[170] Action on Smoking and Health, (August, 2000), "Smoke-free provision in the hospitality industry: Economic and policy implications," available at http://www.ash.org.uk/html/publicplaces/html/pubbrief.html.
[171] Sydney Morning Herald, May 2, 2001
[172] Chapman, Simon, (1998), in *British Medical Journal* 316 (7133): 728ff., March 7, 1998.
[173] The Conference Board of Canada, *The Economics of Smoke-Free Restaurants,* March, 1996, prepared by the Canadian Tourism Research Institute and the Custom Economic Services Group, pages 1 and 35.
[174] Smith, Amy, (February, 2001), "Muir takes hard line on public smoking," *Sunday Herald,* Halifax, page 1.
[175] Corsun, David, Young, Cheri, and Enz, Cathy, (1996), "Should NYC's restaurateurs lighten up?", *Cornell Hotel and Restaurant Administration Quarterly,* April, 1996.
[176] Glantz, Stanton, and Smith, Lisa, (1994), "The Effect of Ordinances Requiring Smoke-Free Restaurants on Restaurant Sales," *American Journal of Public Health* 84 (7): 1081-1085, July 1994, page 1084; Hyland, Andrew, et. al. (1999), "Analysis of Taxable Sales Receipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business," *Journal of Public Health Management and Practice* 5 (1): 14-21, January, 1999.
[177] Siegel, M., *Smoking and Restaurants: A Guide for Policy-Makers,* Tobacco Education Clearinghouse of California, September, 1994, cited in Hyland, et. al.., op. cit., page 15.
[178] Statistics Canada, *Canadian Economic Observer,* February, 1995, catalogue no. 11-010.
[179] Statistics Canada, *Restaurants, Caterers, Taverns Receipts,* no. M52, Nova Scotia, annual reports, adjusted to constant 1996$, using the Nova Scotia Consumer Price Index for "Food Purchased from Restaurants", Statistics Canada, CANSIM database 7466, P 803032.
[180] For summary of California legislation, see Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001.
[181] Taylor Consulting Group, (1993), *The San Luis Obispo Smoking Ordinance: A Study of the Economic Impacts on San Luis Obispo Restaurants and Bars,* submitted to City of San Luis Obispo Smoking Ordinance Economic Analysis Steering Committee, January, 1993, page 2.
[182] Taylor Consulting Group, op. cit., page 1.
[183] Idem.
[184] Idem.
[185] Glantz, Stanton, and Smith, Lisa, (1992), cited in Taylor Consulting Group, op. cit., footnote 2, page 2; Glantz, Stanton, and Smith, Lisa (1994), "The Effect of Ordinances Requiring Smoke-Free Restaurants on Restaurant Sales," *American Journal of Public Health,* 84 (7): 1081-1085, July, 1994; Glantz, Stanton, and Smith, Lisa, (1997), "The Effect of Ordinances Requiring Smoke-Free Restaurants and Bars on revenues: A Follow-Up," *American Journal of Public Health* 87 (10): 1687-1693), October, 1997.
[186] Glantz and Smith (1997), op. cit., pages 1687 and 1690.
[187] Glantz, Stanton, "Effect of smokefree bar law on bar revenues in California," *Tobacco Control* 2000 )9): 111-112.
[188] Perley, Michael, (1997), "Summary of evidence re: economic impact of smoke-free hospitality industry policies," Memorandum, Ontario Campaign for Action on Tobacco, September, 1996, updated March, 1997, page 4, citing testimony before the New York City Council, June 6, 1994, by Barry Fogel, owner of Jacopo's Restaurant Group, California, and former president of BHRA.
[189] Idem. and Glantz and Smith (1994), op. cit.
[190] Glantz and Smith (1994), op. cit., pages 1081-1085.
[191] Maroney, Neal, Sherwood, Deborah, and Stubblebine, Wm Craig, (1994), "The Impact of Tobacco Control Ordinances on Restaurant revenues in California," The Claremont Institute for Economic Policy Studies, The Claremont Graduate School, January, 1994.
[192] Smith, Amy, (2001), "Muir takes hard line on public smoking," *The Sunday Herald,* Halifax, 4 February, 2001, page A1.
[193] Maroney, et. al., op. cit., especially pages 7, 8, 15, 20 and 23.
[194] Idem.

[195] Centers for Disease Control and Prevention, (1995) "Assessment of the Impact of a 100% Smoke-Free Ordinance on Restaurant Sales – West Lake Hills, Texas, 1992-1994," *Morbidity and Mortality Weekly Report (MMWR)*, 44 (19): 369-372, May 19, 1995; and reprinted in *Journal of the American Medical Association* 274 (3): 206-208, July 19, 1995.
[196] *MMWR*, op. cit., page 372.
[197] *MMWR*, op. cit., page 371.
[198] Idem. with particular reference to Glantz and Smith (1994), op. cit., Maroney, et. al., (1994) op. cit., and Taylor Consulting Group, (1993), op. cit.. All three of these studies are described above.
[199] Pope, Gregory, and Bartosch, William, 1997), *Effect of Local Smoke-Free Restaurant Policies on Restaurant Revenue in Massachsetts*, Center for Health Economics Research, submitted to Massachusetts Department of Public Health, April 22, 1997.
[200] Ibid., page 3.
[201] Ibid., page 4.
[202] Pope, G., et. al., (1995), "The Economic Impact of Brookline's Restaurant Smoking Ban," Health Economics Research, Inc., November, 1995, cited in Perley, Michael, Ontario Campaign for Action on Tobacco, memorandum September 1996, updated March 1997, page 5.
[203] Bartosch, William, and Pope, Gregory, (2000). *The Economic Effect of Restaurant Smoking Restrictions on Restaurant Business in Massachusetts 1992-1998: Final Report*, Center for Health Economics Research, submitted to Massachusetts Department of Public Health, November 27, 2000.
[204] Ibid., pages 4-1 to 4-4, especially charts 1 and 2.
[205] Ibid., pages 4-13 and 5-1.
[206] Ibid., page 4-13.
[207] Sciacca, John and Ratliff, Michael, (1998), "Prohibiting Smoking in Restaurants: Effects on Restaurant Sales," *American Journal of Health Promotion* 12 (3): 176-184, January/February, 1998.
[208] Ibid., pages 176 and 182.
[209] Ibid., page 180, and footnotes 9-12, page 184, referring to the studies considered above.
[210] Ibid., page 183.
[211] Ibid., page 184.
[212] Hyland, Andrew, Cummings, K. Michael, and Nauenberg, Eric, (1999), "Analysis of Taxable Sales Receipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business?", *Journal of Public Health Management and Practice* 5 (1): 14-21, January, 1999.
[213] Suffolk and Westchester Counties adopted smoke-free restaurant laws in 1995 and 1996 respectively. See ibid., page 16. Because the authors are concerned to assess the impact of the New York City legislation specifically, state-wide comparison exclude these two counties and include only the 55 counties without smoking restrictions.
[214] Hyland et. al., op. cit., pages 19 and 21.
[215] Hyland, Andrew, and Cummings, K. Michael, (1999), "Restaurant Employment Before and After the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 22-27, January, 1999.
[216] Perley, Michael, (1997), "Summary of evidence re: economic impact of smoke-free hospitality industry policies," Memorandum, Ontario Campaign for Action on Tobacco, September, 1996, updated March, 1997, page 4. Survey results are available directly from Zagat, 4 Columbus Circle, New York, NY 10019.
[217] Except where separately footnoted, all data presented in this paragraph are cited by Hyland, Andrew and Cummings, K. Michael, (1999), "Analysis of Taxable Sales Receipts," op. cit., pages 20-21. For the restaurateur survey results, see Hyland, Andrew, and Cummings, K. Michael, (1999), "Restaurateur Reports of the Economic Impacts of the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 37-42, January, 1999.
[218] Perley, Michael, "Summary of evidence re: economic impact of smoke-free hospitality industry policies," Memorandum of the Ontario Campaign for Action on Tobacco, March, 1997, pages 1-2.
[219] Cited in "New Study Adds to Economic Evidence Supporting Smoke-Free Restaurant Ordinances," Advocacy Institute, June 25, 1999, available at http://www.advocacy.org/alerts/sfrestaurants.html.
[220] Glantz, Stanton, and Charlesworth, Annemarie, (1999), "Tourism and Hotel Revenues Before and After Passage of Smoke-Free Restaurant Ordinances," *Journal of the American Medical Association* 281 (20): 1911-1918, May 26, 1999. See particularly Table 1, page 1911, which cites actual quotes and statements from opponents of smoke-free legislation on predicted effects of the ordinances on tourism.
[221] For a complete list of official data sources for all nine locales, see ibid., table 2, page 1913.
[222] Ibid., pages 1911 and 1917.

[223] Ibid., pages 1912 and 1917.
[224] Goldstein, A., and Sobel, R., (1998), "Environmental Tobacco Smoke Regulations Have Not Hurt Restaurant Sales in North Carolina," *North Carolina Medical Journal* 59 (5): 284-287, September/October, 1998.
[225] Glantz and Charlesworth, (1999), op. cit., page 1911.
[226] Pacific Analytics, (2001), *The Economic Impacts of the Proposed Amendment to the ETS Regulation,* Prepared for The Workers Compensation Board of British Columbia, February, 2001, pages 2 and 3 (emphasis in original text).
[227] Warner, Kenneth, (2000), "The economics of tobacco: myths and realities," *Tobacco Control* 9: 78-89, page 80, with reference to Alberta Tobacco Control Centre, *The economic impact of smoke-free restaurant bylaws,* Alberta, June 22, 1999.
[228] Warner, op. cit., page 81.
[229] Tourism Association of Nova Scotia, *TIANS Policy Issue: Smoking Legislation.* 23 March, 1998.
[230] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from second-hand tobacco smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 29.
[231] Lisa Clifford, "Smoking ban could drag tourism down – hotels rep.," quoted in *The Halifax Chronicle-Herald,* November 25, 1997.
[232] Tourism Nova Scotia, *1998 Nova Scotia Tourism Statistical Review,* Table V-1 and Figure V-2, Visitor Volume 2 and 3.
[233] Minnesota Tobacco Litigation Depository (Bates No. 2500147496), cited in Glantz, Stanton, and Charlesworth, Annemarie, (1999), "Tourism and Hotel Revenues Before and After Passage of Smoke-Free Restaurant Ordinances," *Journal of the American Medical Association* 281 (20): 1911-1918, May 26, 1999, pages 1916-1917.
[234] Tourism Industry Association of Nova Scotia, *Smoking Survey Results,* March 23, 1998.
[235] Applied Economics, "Economic Impact of the City of Mesa Smoke-free Ordinance," cited in Sciacca and Ratliff (1998), op. cit., pages 181-182.
[236] Glantz and Charlesworth, (1999), op. cit., table 3, page 1914, and figure 1, page 1915.
[237] Pacific Analytics Inc., *The Economic Impacts of the Proposed Amendment to the ETS Regulation,* prepared for The Workers Compensation Board of British Columbia, February, 2001; see page 16 on exclusion of food sales, and page 11 on short-term limitations of the study.
[238] Ibid., pages 14-17.
[239] Ibid., page 16.
[240] Ibid., page 24
[241] "Victoria drinks up despite tough smoking law," *Vancouver Sun,* 20 November, 1999, available at: http://www.vancouversun.com/nesite/news/991120/3176472.html.
[242] Pacific Analytics (2001), op. cit., page 27.
[243] Ibid., page 29.
[244] Idem.
[245] Corsun, David, Young, Cheri, and Enz, Cathy, (1996), "Should NYC's restaurateurs lighten up?", *Cornell Hotel and Restaurant Administration Quarterly,* April, 1996.
[246] Pacific Analytics, (2001), *The Economic Impacts of the Proposed Amendment to the ETS Regulation,* prepared for the Workers Comepnsation Board of British Columbia, February, 2001, page 2.
[247] National Restaurant Association, (1993), *Smoking in Restaurants: A Consumer Attitude Survey,* Washington D.C., cited in Sciacca, (1997), op. cit., pages 180-181, Corsun, et. al., (1996), op. cit., footnote 1; and Sciacca, John, (1996), "A Mandatory Smoking Ban in Restaurants: Concerns versus Experiences," *Journal of Community Health* 21 (2): April 1996,
[248] Corsun, et. al., (1996), op. cit. Please note that this article was downloaded from the Internet, and page numbers listed here may not correspond exactly with those in the *Cornell Hotel and Restaurant Administration Quarterly.* The study may also be obtained by contacting Center for Hospitality Research, 545 Statler Hall, School of Hotel Administration, Cornell University, Ithaca, NY 14853-6902; (phone: 607-255-4054).
[249] Ibid., page 25.
[250] Ibid., exhibit 7.
[251] Ibid., pages 25. 27 and 29.
[252] Chicago Tribune, April 11, 1995, page 3, cited in Corsun, et. al., op. cit., page 25.
[253] Perley, Michael, (1997), "Summary of evidence re: economic impact of smoke-free hospitality industry policies," Memorandum, Ontario Campaign for Action on Tobacco, September, 1996, updated March, 1997, page 4. Survey results are available directly from Zagat, 4 Columbus Circle, New York, NY 10019.

[254] Corsun, et. al., op. cit., page 30.
[255] Evans, M.K., (1996), "Review of Cornell Survey on Smoking Ban in New York City: Executive Summary," *Cornell Hotel and Restaurant Administration Quarterly* 37 (5): 8-9.
[256] Hyland, Andrew, Cummings, K. Michael, and Nauenberg, Eric, (1999), "Analysis of Taxable Sales Receipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business?", *Journal of Public Health Management and Practice* 5 (1): 14-21, January, 1999.
[257] Hyland, Andrew, and Cummings, K. Michael, (1999), "Consumer Response to the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 28-36, January, 1999.
[258] Corsun, et. al., page 25.
[259] Hyland, et. al., op. cit., Table 1, page 31.
[260] Ibid., page 28.
[261] Hyland, Andrew, and Cummings, K. Michael, (1999), "Restaurant Employment Before and After the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 22-27, January, 1999.
[262] Hyland, Andrew, and Cummings, K. Michael, (1999), "Restaurateur Reports of the Economic Impacts of the New York City Smoke-Free Air Act," *Journal of Public Health Management and Practice* 5 (1): 37-42, January, 1999.
[263] Biener, L. and Siegel, M., (1997), "Behavior Intentions of the Public After Bans on Smoking in Restaurants," *American Journal of Public Health* 87 (12): 2042-2044, December, 1997; and Beiner, L., and Roman, A.M., (1999), *1998 Massachusetts Adult Tobacco Survey: Technical Report and Tables,* cited in Bartosch and Pope (2000), op. cit.
[264] Biener and Siegel, op. cit., page 2042.
[265] Ibid., pages 2042-2044.
[266] Idem.
[267] Biener, L., and Fitzgerald, "Smoky Bars and Restaurants: Who Avoids Them and Why?", (1999), *Journal of Public Health Management and Practice* 5 (1): 74-78.
[268] Idem. cited in Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001.
[269] Sciacca, John, (1996), "A Mandatory Smoking Ban in Restaurants: Concerns versus Experiences," *Journal of Community Health* 21 (2): 133-150, April, 1996
[270] Cremieux, Pierre-Yves and Oulette, Pierre, (2001), "Actual and perceived impacts of tobacco regulation on restaurants and firms," *Tobacco Control* 10: 33-37, Spring, 2001.
[271] Ibid., pages 33-34.
[272] Idem.
[273] Stanwick, Thompson, et. al., (1988), "The Response of Winnipeg Retail Shops and Restaurants to a Bylaw Regulating Smoking in Public Places," *CJPH* 79: 226-230, cited in BC Workers Compensation Board , (1999), *Economic Effects of Smoke-Free Ordinance in the Hospitality Sector,* November, 1999, page 1.
[274] Idem, citing Schofield, Considine et. al., (1993), "Smoking Control in Restaurants: The Effectiveness of Self-Regulation in Australia," *AJPH* 83: 1284-1288.
[275] Idem., citing Sciacca and Eckrem, (1993), "Effects of a City Ordinance Regulating Smoking in Restaurants and Retail Stores," *Journal of Community Health* 18 (3): 175-182.
[276] Ibid, page 2, citing Angus Reid, (1995), *No Smoking Bylaw Survey* conducted for the Metropolitan Board of Health of Greater Vancouver, May, 1995.
[277] Ibid, page 4, citing Angus Reid (1997), *Tobacco Use in BC,* Survey conducted for the Heart and Stroke Foundation of BC.
[278] Ibid., page 5, citing Angus Reid (1998), *Survey of Attitudes to second-hand smoke,* for the Heart and Stroke Foundation of BC, August, 1998.
[279] Ibid., page 7, citing Augus Reid Group, (1999), *Bar Patrons Study,* conducted for the Clean Air Coalition, October 13, 1999.
[280] Idem., citing Workers Compensation Board of BC and Clean Air Coalition (1999), *Survey of Attitudes of British Columbians,* July, 1999.
[281] Idem., citing BC Workers Compensation Board, (1999), *Analysis of WCB assessments in food concessions/restaurants and in pubs/bars for Victoria and other areas,* November, 1999.
[282] Ibid., page 8, citing LCLB, (1999), *Analysis of liquor sales data by licensed establishments,* November 15, 1999.
[283] Ibid., page 5, citing The American Beverage Institute, (1998), *The Impact of California's Smoking Ban on Bars, Taverns and Night Clubs,* August, 1998.

[284] Idem., citing State of California Board of Equalization Report, (1998), "Comparison of 1st Quarter 1997 and 1st Quarter 1998 Taxable Sales of Selected Eating and Drinking Places with General on-Sale Licenses," September, 1998.
[285] Ibid., page 8, citing State of California Board of Equalization Report on 4th quarter and annual sales figures for bars and restaurants, in the years 1996, 1997 and 1998.
[286] Aspen Resort Association, "Business Update," October 1986 thorugh March 1987; Aspen/Pitkin Environmental Health Department, November 29, 1990, cited in Perley, Michael, (1997), Memorandum, Ontario Campaign for Action on Tobacco, September, 1996, updated March, 1997.
[287] Perley, op. cit., page 6, citing *Associated Press* report entitled "Smoking curbs fail to doom bars, eateries," in the *Rocky Mountain News*, 2 February, 1997.
[288] Perley, op. cit., page 2.
[289] Perley, op. cit., page 3
[290] Poll done on behalf of BBC's *Food and Drink* programme, cited in Action on Smoking and Health, (2000), "Smoke-free provision in the hospitality industry: Economic and policy implications," August, 2000, available at http://www.ash.org.uk/html/publicplaces/html/pubbref.html.
[291] Cited in Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices*, Toronto, May, 2001, page 32.
[292] "Bar smoking ban gets wide backing," *Los Angeles Times*, 27 May, 1998.
[293] Expert Panel on the Renewal of the Ontario Tobacco Strategy (1999), *Actions will speak louder than words*, report to the Ontario Minister of Health, February, 1999, page 22.
[294] Borland, Ron, et. al., (1990), "Changes in acceptance of workplace smoking bans following their implementation: A prospective study," cited in Borland, Ron, et. al., (1992), "Protection from Environmental Tobacco Smoke in California," *Journal of the American Medical Association* 268 (6): 749-752.
[295] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices*, Toronto, May, 2001, page 32.
[296] City of Vancouver (1994), *Policy Report from Medical Officer of Health: 100% Smoke-Free Indoor Environments*, 31 October, 1994, Database CC05, Document: 1994 1031:000200010, cited in Health Canada, *The Economics of Workplace Smoking Restrictions*, available at: http://www.hc-sc.gc.ca/hppb/tobacc...tions/workplace/work/wplcsmk05.htm.
[297] Health Canada (1999), "Smoking Behaviour of Canadians: Cycle 2, 1996/97", Fact Sheet 1.9: "Exposure to Environmental Tobacco Smoke," *National Population Health Survey Highlights*, January, 1999.
[298] Newfoundland Statistics Agency, Department of Finance (2001), special tabulation, personal communication, May, 2001.
[299] Paul Schneidereit, "Most want smoke ban, poll finds: Time to butt out in public places, 76 per cent agree," *The Chronicle-Herald*, Halifax, 13 June, 2001, pages 1 and 2.
[300] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices*, Toronto, May, 2001. For summary of agreed findings, see pages 45-46.
[301] Ibid., page 47.
[302] Ibid., page 46.
[303] The Library and Center for Knowledge Management, University of California, San Francisco (2000), *Tobacco Control Archives: Collections* at http://www.library.ucsf.edu/tobacco/calminnesota/.
[304] See: http://www.ash.org.uk/html/conduct/html/trustus.html.
[305] Philip Morris, (1985), "The Perspective of Philip Morris International on Smoking and Health Issues," text of the discussion document used at the meeting of top management, 29 March, 1985, Bates Number 2023268329-49.
[306] The Roper Organization, *A Study of Public Attitudes Towards Cigarette Smoking and the Tobacco Industry in 1978*, volume 1, 1978, quoted in S.A. Glantz et. al, *The Cigarette Papers*, University of California Press, 1996.
[307] R.N. Ferguson and M. Waugh, (1987), "Social-Political Context of Cigarette Sales and Use in the U.S. – 1987," Philip Morris Inter-Office Correspondence, Memo to the Strategic Planning Committee, 27 May, 1987, Bates Number 2050864094-97.
[308] T. Wells, (1994), CAC Presentation Number 4, 8 July, 1994, Bates Number 2041183751-90.
[309] Tobacco Institute, Public Smoking: The Problem (SDC Introduction," undated but circa 1985, Bates Number TIMN0013710-23.
[310] P.G. Sparber, "Smoking in the Workplace," Tobacco Institute, undated, Bates Number TIMN0014640-64.

[311] W. Kloepfer, Report on Public Smoking Issue Executive Committee, Tobacco Institute, 10 April, 1985, Bates Number TIMN0013710-23.
[312] Philip Morris, 24 June, 1987, footnote 123 at http://www.ash.org.uk/html/conduct/html/trustus.html.
[313] J. Basques, (1987) "Minutes of EEMA/EEC ETS Strategy Meeting Held On 870511, "Strictly Confidential Memo, 26 May, 1987, Bates Number 2046754737-40.
[314] PM Asia Corporate Affairs Plan, 1990-1992, December 1989, Bates Number 2500084000-42.
[315] D. Hoel (1988), "Joint Meeting on ETS – London, England," Privileged and Confidential memo to F.S. Newman, Philip Morris, 18 June, 1988, Bates Number 2021548222-35.
[316] J.L. Charles (1980), "Personal and Confidential: Small-airways Dysfunction in Nonsmokers Chronically Exposed to Tobacco Smoke," J.R. White and H. Froeb, Memo to T.S. Osdene, 30 March, 1980.
[317] Dr. S. Boyse (1988), "Note On A Special Meeting Of The UK Industry On Enviromental Tobacco Smoke London," 17 February, 1988, Bates Number 2063791181-87.
[318] Covington and Burling (1990), "Report on the European Consultancy Programme," Privileged and Confidential Memorandum, 1 March, 1990, Bliley Database, Bates Number 2500048956-69. Covington and Burling is the law firm of the Tobacco Institute in Washington (see NYC Smokefree Air Act Hearing, 9/26/94, page 7, at: http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html.)
[319] D.I. Greenberg (1993), "International Agency for Research on Cancer Study," 15 September, 1993, Bates Number 25013418117-23.
[320] T. Walls, (1994), CAC Presentation Number 4, 8 July, 1994, Bates Number 2041183751-90.
[321] Philip Morris, "EFTA Eastern Europe Middle East Africa Long Range Plan 1990-1992," December 1989, Bates Number 2500066142/6294; Philip Morris, (1985), "Issues Raised in Hamish's Memo," 29 March, 1985, Bates Number 2023268340; Philip Morris (1992), "Government Affairs Objectives," 7 January, 1992, Bates Number 2023200348/0355.
[322] Ontario Tobacco Research Unit, University of Toronto, (2001), *Protection from Second-Hand Tobacco Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 29.
[323] T Walls (1993), *Grasstops Government Relations,* Philip Morris, 30 March, 1993, Bates Number 2024023252-65.
[324] Phlip Morris Corporate Affairs Department Goals, 1992, Bates Number 2047079509-12.
[325] MacKinley, S. (July 18, 1997). "Smoke claims fraudulent. Health officials lying abut second-hand smoke, analyst says". *The Daily News*, page 6.
[326] Marsden, W. (June, 2001). "Big tobacco's shell game with the truth", *The Montreal Gazette*, page 1.
[327] See for exmaple, T. Walls, "Grasstops Government Relations," Philip Morris, 30 March, 1993, Bates Number 2024023252-65.
[328] See company web sites for R.J. Reynolds (http://www.rjrt.com/COHowWeThink_smokinghealth.asp) and Philip Morris (http://www.pmintl.com/tobacco_issues/issues7.html). For BAT statement see Action for Smoking and Health report, page 2, at http://www.ash.org.uk/html/conduct/html/trustus.html.
[329] House of Commons (UK) Health Selecto Committee, *The Tobacco Industry and the Health Risks of Smoking,* cited at: http://www.ash.org.uk/html/conduct/html/trustus.html., page 2.
[330] See RJR web site at: http://www.rjrt.com/COHowWeThink_smokinghealth.asp
[331] See Philip Morris International web site at: http://www.pmintl.com/tobacco_issues/issues7.html
[332] See RJR web site at: http://www.rjrt.com/COHowWeThink_smokinghealth.asp
[333] Philip Morris (1989), "EFTA Eastern Europe Middle East African Long Range Plan 9000000-920000," December 1989, Bates Number 2500066142-94.
[334] R. M. Corner, (1979), "Countermeasures Development Program – Confidential," 20 May, 1979, Bates Number TIMN0156508-6520.
[335] Suein L. Hwang, (1998), "Tobacco" Tobacco Memos Detail Passive-Smoke Attack," *Wall Street Journal,* New York, April 28, 1998.
[336] See Action for Smoking and Health report, pages 2-3, at http://www.ash.org.uk/html/conduct/html/trustus.html.
[337] Quoted in B. Potter, "Tobacco Chief to Fight Advert Ban," *Daily Telegraph,* U.K., 15 May, 1997, cited in Action for Smoking and Health report, page 5 and footnote 26, at http://www.ash.org.uk/html/conduct/html/trustus.html.
[338] Testimony by Barry Fogel, ex-president, Beverly Hills Restaurant Association to NYC Smokefree Air Act Hearing, 9/26/94; at http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html.
[339] Testimony by Margaret Hamburg, NYC Department of Health for Mayor Guiliani, to NYC Smokefree Air Act Hearing, 9/26/94; at http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html

[340] Testimony by Lisa Smith, Health Policy researcher, University of California, San Francisco to NYC Smokefree Air Act Hearing, 9/26/94; at http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html
[341] Testimony by Duncan Hoop, economist with Price Waterhouse, to NYC Smokefree Air Act Hearing, 9/26/94; at http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html
[342] T. Walls, (1994), CAC Presentation Number 4, 8 July, 1994, Bates Number 2041183751-90.
[343] Testimony by Scott Wexler, URHTA and Joe Cherner, Smokefree Educational Services, to NYC Smokefree Air Act Hearing, 9/26/94; at http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html
[344] Testimony by Ann Siebert, Vermont State Representative, to NYC Smokefree Air Act Hearing, 9/26/94; at http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html
[345] Ong, Elisa, and Glantz, Stanton, (2000), "Tobacco industry efforts subverting International Agency for Research on Cancer's second-hand smoke study," *The Lancet,* 355, April 8, 2000.
[346] Idem. and Boffetta, P, et. al, International Agency for Research on Cancer (IARC) (1998), "Multicenter case-control study of exposure to environmental tobacco smoke and lung cancer in Europe," *Journal of The National Cancer Institute* 90: 1440-1450, Oxford University Press.
[347] Macdonald, Victoria, "Passive Smoking doesn't Cause Cancer – Official," Electronic Telegraph, March 8, 1998.
[348] Ong and Glantz, op. cit., page 1254 and 1257.
[349] Ibid., page 1253.
[350] Quoted in Macdonald, op. cit.
[351] World Health Organization (1998), "Passive Smoking Does Cause Lung Cancer, Do Not Let Them Fool You," press release WHO/29, 9 March, 1998.
[352] Ong and Glantz, op. cit., page 1256.
[353] IARC, op. cit., page 1440.
[354] Ong and Glantz, op. cit., page 1258.
[355] Idem.
[356] Idem.
[357] Idem.
[358] Ibid., page 1253.
[359] Barnes, Deborah, and Bero, Lisa, (1998), "Why Review Articles on the Health Effects of Passive Smoking Reach Different Conclusions," *Journal of the American Medical Association* 279 (19): 1566-1570, May 20, 1998.
[360] Idem.
[361] Idem.
[362] Idem.
[363] Traynor, Michael, et. al., (1993), "New Tobacco Industry Strategy to Prevent Local Tobacco Control," *Journal of the American Medical Association* 270 (4): 479-486, July 28, 1993.
[364] Samuels, Bruce and Glantz, Stanton, (1991), "The Politics of Local Tobacco Control," *Journal of the American Medical Association* 266 (15), October 16, 1991: 2110-2117, page 2112.
[365] Idem.
[366] Expert Panel on the Renewal of the Ontario Tobacco Strategy, (1999), *Actions will speak louder than words: Getting serious about tobacco control in Ontario: A Report to the Minister of Health,* February, 1999, page 22.
[367] Ibid., page 2110.

## Selected Bibliography

Action on Smoking and Health (1999). *Fact Sheet No. 14 - Smoking in Public Places.* Available from http://www.ash.org.uk/html/factsheets/html/fact14.html . Internet. Accessed 18 February, 2001.

Action on Smoking and Health (2000). *Smoke-free provision in the hospitality industry - Economic and policy implications.* Available from http://www.ash.org.uk/html/publicplaces/html/pubbrief.html. Internet. Accessed 18 February, 2001.

Allen, R.L. (1998). Secondhand smoke signals Boston suit. *Nation's Restaurant News,* Vol. 32, No. 12.

American College of Occupational and Environmental Medicine (2000). *Epidemiological Basis for an Occupational and Environmental Policy on Environmental Smoke.* Available from http://www.acoem.org/paprguid/papers/etspaper.htm . Internet. Accessed 15 February, 2001.

Anonymous, (1996). Letters and comment [NYC Smoking Study]. *Cornell Hotel and Restaurant Administration Quarterly,* Vol. 37, No. 5.

Anonymous, (1997). The high price of cigarette smoking. *Business and Health,* Aug., 1997.

Anonymous, (1998). Bar business hurt substantially by smoking ban, survey claims. *Nation's Restaurant News,* May 18, 1998.

Anonymous, (2000). Doing Time Cold Turkey. *SecondWind,* Edmonton, Fall, 2000.

Arnold, K., & Eckstein, D. (1999). Some Women May Be Genetically Susceptible to Cancer From Environmental Tobacco Smoke. *Journal of the National Cancer Institute,* Vol. 91, No. 23.

Assessment of the Impact of a 100% Smoke-Free Ordinance on Restaurant Sales - West Lake Hills, Texas, 1992-1994. *Morbidity and Mortality Weekly Report,* Centers for Disease Control and Prevention, reprinted in *Journal of the American Medical Association,* Vol. 274, No. 3.

Barnes, D.E., & Bero, L.A. (1998). Why Review Articles on the Health Effects of Passive Smoking Reach Different Conclusions. *Journal of the American Medical Association* Vol. 279, No. 19.

Biener, L., & Siegel, M. (1997). Behavior intentions of the public after bans on smoking in restaurants and bars. *American Journal of Public Health,* Vol. 87, No. 12.

Boffetta, P. et al. (1998). Multicenter case-control study of exposure to environmental tobacco smoke and ling cancer in Europe. *Journal of the National Cancer Institute,* Vol. 90, No. 19.

Borland, R., Pierce, J.P., Burns, D.M., Gilpin, E., Johnson, M., & Bal, D. (1992). Protection from Environmental Tobacco Smoke in California: The Case for a Smoke-Free Workplace. *Journal of the American Medical Association* Vol. 268, No. 7.

Burns, D.M.. (1992). Environmental Tobacco Smoke: The Price of Scientific Certainty. *Journal of the National Cancer Institute,* Vol. 84, No. 18.

Center for Health Economics Research (1997). *Effect of Local Smoke-Free Restaurant Policies on Restaurant Revenue in Massachusetts.* Massachusetts Dept. of Public Health, Boston.

Center for Health Economics Research (2000). *The Economic Effect of Restaurant Smoking Restrictions on Restaurant Business in Massachusetts 1992-1998.* Massachusetts Dept. of Public Health, Boston.

Centers for Disease Control and Prevention (1996). *ETS - Environmental Tobacco Smoke.* Available from http://www.cdc.gov/tobacco/ets.htm Internet. Accessed 16 February, 2001.

Chapman, S. (1998). Australia [smoking bans]. *British Medical Journal,* Vol. 316, No. 7133.

City of San Luis Obispo (1993). *The San Luis Obispo Smoking Ordinance - A Study of the Economic Impacts on San Luis Obispo Restaurants and Bars.* Taylor Consulting Group, San Luis Obispo, CA.

Cloutier, L. (2001). Clearing the Air. *The Halifax Herald,* Voice of the People, March 11, 2001, page C5.

Corsun, D.L., Young, C.A., & Enz, C.A. (1996). Should NYC's restaurateurs lighten up? *Cornell Hotel and Restaurant Administration Quarterly,* Vol. 37, No. 2.

Cravatta, M. (1997). What if ... everyone stopped smoking?. *American Demographics,* Ithaca, Dec. 1997.

Crawford, F.G. et al. (1994). Biomarkers of environmental tobacco smoke in preschool children and their mothers. *Journal of the National Cancer Institute,* Vol. 86, No. 18.

Crecca, D.H. (1997). Tobacco. *Supermarket Business*, New York, Sept., 1997.

Cremieux, P-Y, & Ouellette, P. (2000). *Actual and perceived impacts of tobacco regulation on restaurants and firms.* Analysis Group/Economics, Cambridge, MA.

Cunningham, R. (2000). *Municipalities in Canada with Smoke-Free laws for Restaurants and Bars.* Canadian Cancer Society.

*Discussion Draft: Indoor Air Quality Regulations Under the Occupational Health and Safety Act June 1995 Working Group Proposal.* Occupational Health and Safety Division, Nova Scotia Dept. of Labour, Halifax.

Eisner, M.D., Smith, A.K., & Blanc, P.D. (1998). Bartenders' Respiratory Health After Establishment of Smoke-Free Bars and Taverns. *Journal of the American Medical Association* Vol. 280, No. 22.

Expert Panel on the Renewal of the Ontario Tobacco Strategy (1999). *Actions Will Speak Louder than Words: getting serious about tobacco control in Ontario. A Report to the Minister of Health.* Expert Panel on the Renewal of the Ontario Tobacco Strategy, Ottawa.

Glantz, S.A., & Charlesworth, A. (1999). Tourism and Hotel Revenues Before and After Passage of Smoke-Free Restaurant Ordinances. *Journal of the American Medical Association,* Vol. 281, No. 20.

Glantz, S.A., & Parmley, W.W. (1991). Passive Smoking and Heart Disease - Epidemiology, Physiology, and Biochemistry. *Circulation* (Cardiovascular Research Institute, University of California, San Francisco) Vol. 83, No. 1.

Glantz, S.A., & Parmley, W.W. (1995). Passive Smoking and Heart Disease - Mechanisms and Risk. *Journal of the American Medical Association,* Vol. 273, No. 13.

Glantz, S.A., & Smith, R.A. (1994). The Effect of Ordinances Requiring Smoke-Free Restaurants on Restaurant Sales. *American Journal of Public Health,* Vol. 84, No. 7.

Glantz, S.A., & Smith, R.A. (1997). The Effect of Ordinances Requiring Smoke-Free Restaurants and Bars on Revenues: A Follow-Up. *American Journal of Public Health,* Vol. 87, No. 10.

Gold, M.S. (1995). *Tobacco.* Plenum Medical Book Company, New York and London.

GPI Atlantic (2000). *Cancer Care Nova Scotia* (section 14 - *Smoking Bans and Restrictions*). **GPI***Atlantic*, Halifax.

Hackshaw, A.K., Law, M.R., & Wald, N.J. (1997). The accumulated evidence on lung cancer and environmental tobacco smoke. *British Medical Journal,* Vol. 315, No. 7114.

Hammond, S.K. et al. (1993). Relationship between environmental tobacco smoke exposure and carcinogen-hemoglobin adduct levels in nonsmokers. *Journal of the National Cancer Institute,* Vol. 85, No. 6.

Hasbach, A. (1998). Is your workplace a threat to your health?. *Consulting - Specifying Engineer,* Workplace Protection Supplement, Denver, 1998

Hastings, J., Kanigel, R., Lee, K., & Schlosberg, S. (1998). Cigarettes out, customers in. *Health*, March 1998.

Health Canada (2000). *Impact of Workplace Smoking Restrictions.* Available from http://www.hc-sc.gc.ca/hppb/tobaccoreduction/publications/workplace/work/wplcsmk04.htm Internet. Accessed 18 February, 2001.

Health Canada (2000). *Regulating ETS Through Occupational Health and Safety Legislation.* Avaliable from http://www.hc-sc.gc.ca/hppb/cessation/air/workplace_smoking/part2_regulating.html . Internet. Accessed 26 February 2001.

Health Canada (2000). *The Economics of Workplace Smoking Restrictions.* Available from http://www.hc-sc.gc.ca/hppb/tobaccoreduction/publications/workplace/work/wplcsmk05.htm Internet. Accessed 18 February, 2001.

Hecht, S. (1994). Environmental Tobacco Smoke and Lung Cancer: The Emerging Role of Carcinogen Biomarkers and Molecular Epidemiology. *Journal of the National Cancer Institute*, Vol. 86, No. 18.

Hwang, S.L. (1998). Tobacco: Tobacco Memos Detail Passive-Smoke Attack. *The Wall Street Journal*, Apr. 28, 1998, page B1.

Hyland, A., & Cummings, K.M. (1999). Consumer Response to the New York City Smoke-Free Air Act. *Journal of Public Health Management and Practice*, Vol. 5, No. 1. pp. 28-36.

Hyland, A., Cummings, K.M., & Nauenberg, E. (1999). Analysis of Taxable Sales Receipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business? *Journal of Public Health Management and Practice*, Op. Cit. pp. 14-21.

Kabat, G.C., Stellman, S.D., & Wynder, E.L. (1995). Relation between Exposure to Environmental Tobacco Smoke and Lung Cancer in Lifetime Nonsmokers. *American Journal of Epidemiology*, Vol. 142, No. 2.

Klesges, R.C., Haddock, C.K., Chang, C.F., Talcott, G.W., & Lando, H.A. (2000). *The association of smoking and the cost of military training.* The University of Memphis Center for Community Health, Memphis, TN.

Langreth, R. (1998). New Smoking Study Likely to Have Broad Impact. *The Wall Street Journal*, Jan. 15, 1998, page B12.

Leaders: Land of the smoke-free. *The Economist*, London, Apr. 25, 1998.

Lee, P.N. (1992). *Environmental Tobacco Smoke and Mortality.* Karger, Basel, Switzerland

Lister, S.M., & Jorm, L.R. (1998). Parental smoking and respiratory illnesses in children aged 0-4 years: ABS 1989-90 National Health Survey results. *Australian and New Zealand Journal of Public Health,* Vol. 22, No. 7.

Macdonald, V. (1998). Passive Smoking Doesn't Cause Cancer - Official. *Electronic Telegraph,* March 8, 1998. Available from http://www.junkscience.com/news/newets.htm. Internet. Accessed 18 February, 2001.

Maroney, N., Sherwood, D., & Stubblebine, W.C. (1994). *The Impact of Tobacco Control Ordinances on Restaurant Revenues in California.* The Claremont Institute for Economic Policy Studies, Claremont, CA.

Martin, R. (1997). Smoke-ban study burns operators, ignites red-hot rebuttals. *Nation's Restaurant News,* Vol. 31, No. 46.

Miller, L.S., Zhang, X., Novotny, T., Price, D.P., & Max, W. (1998). State estimates of medicaid expenditures attributable to cigarette smoking, fiscal year 1993. *Public Health Reports,* Vol. 113, No. 2.

Mintz, M. (1998). The ACLU and the tobacco companies. *Nieman Reports,* Vol. 52, No. 1.

Morbidity and Mortality Weekly Report (2000). *Tobacco Topics 1990-1999.* Centers for Disease Control and Prevention, Atlanta, GA. [Compendium of MMWR reprints].

National Population Health Survey Highlights No. 1 (1999). *Smoking Behaviour of Canadians: cycle 1, 1994/95 and cycle 2, 1996/97.* Health Canada, Ottawa.

Nova Scotia Department of Health (2001). *Towards Healthier Communities in Nova Scotia - A Discussion Paper.* Available from http://www.gov.ns.ca/health/smoke_free/default.htm . Internet. Accessed 15 February, 2001.

Occupational Health and Safety Act (1996). Province of Nova Scotia.

Omnifacts Research Ltd. (1997). *An Analysis of the Response to the Smoke-Free Places Discussion Paper.* Nova Scotia Dept. of Public Health, Halifax.

Ong, E.K., & Glantz, S.A. (2000). Tobacco industry efforts subverting International Agency for Research on Cancer's second-hand smoke study. *The Lancet,* Vol. 355. April 8, 2000.

Ontario Campaign for Action Against Tobacco (2001). *2nd Hand Smoke.* Available from http://www.ocat.org/. Internet. Accessed 11 April, 2001.

Perley, M. (1997). Memorandum: summary of evidence re: economic impact of smoke-free hospitality industry policies. *Ontario Campaign for Action on Tobacco,* Toronto.

Philip Morris International (2001). *Secondhand Smoke.* Available from http://www.pmintl.com/tobacco_issues/issues7.html . Internet. Accessed 18 February, 2001.

Pipe, A. (1998). Smoking, restaurants and bars: The Toronto experience. *Canadian Medical Association Journal,* Vol. 158, No. 1.

Price, P. (1989). *Passive Smoking - Health Effects and Workplace Resolutions.* Canadian Centre for Occupational Health and Safety, Hamilton, Ont.

Raynauld, A. & Vidal, J-P. (1990). *The Cost of Smoking: Myth and Reality.* Smoker's Freedom Society, Toronto.

Repace, J. (2000). *Can Ventilation Control Second-hand Smoke in the Hospitality Industry?* Repace Associates, Inc., Bowie, MD.

Richmond, R., Wodak, A., Bourne, S., & Heather, N. (1998). Screening for unhealthy lifestyle factors in the workplace. *Australian and New Zealand Journal of Public Health,* Vol. 22, No. 3.

R.J. Reynolds Tobacco Company (2001). *Corporate Responsibility: Marketing.* Available from http://www.rjrt.com/CO/pages/COHowWeThink_smokinghealth.asp . Internet. Accessed 18 February, 2001.

Rothwell, K. (1999). EHC 211: *Health Effects of Interactions between Tobacco Use and Exposure to other Agents.* World Health Organization, Geneva.

Samuels, B., & Glantz, S.A. (1991). The Politics of Local Tobacco Control. *Journal of the American Medical Association,* Vol. 266, No. 15.

SCARC Action Alert (1996). *Study Finds NYC's Smoke-Free Air Act Has Not Hurt Restaurant Business.* Available from http://www.tobacco.org/Misc/rest.html. Internet. Accessed 17 February, 2001.

Sciacca, J.P. (1996). A Mandatory Smoking Ban in Restaurants: Concerns Versus Experiences. *Journal of Community Health,* Vol. 21, No. 2.

Sciacca, J.P., & Ratliff, M.I. (1998). Prohibiting Smoking in Restaurants: Effects on Restaurant Sales. *American Journal of Health Promotion,* Vol. 12, No. 3.

Siegel, M. (1993). Review - Involuntary Smoking in the Restaurant Workplace. *Journal of the American Medical Association,* Vol. 270, No. 4.

*Smoke-free By-laws: Questions and Answers.* Smoke-Free Kings, Oct., 2000.

State-Specific Prevalence of Current Cigarette Smoking Among Adults and the Proportion of Adults Who Work in a Smoke-Free Environment - United States, 1999. *Morbidity and Mortality Weekly Report,* Nov. 3, 2000. Centers for Disease Control and Prevention, Atlanta, GA.

Stearns, S.C., Bernard, S.L., Fasick, S.B., Schwartz, R., et. al. (2000). The economic implications of self-care: The effect of lifestyle, functional adaptations, and medical self-care among a national sample of Medicare beneficiaries. *American Journal of Public Health*, Vol. 90, No. 10.

Steenland, K. (1992). Review - Passive Smoking and the Risk of Heart Disease. *Journal of the American Medical Association,* Vol. 267, No. 1.

Stockwell, H.G. et al. (1992). Environmental tobacco smoke and lung cancer risk in nonsmoking women. *Journal of the National Cancer Institute,* Vol. 84, No. 18.

The Conference Board of Canada (1996). *The Economics of Smoke-Free Restaurants*. The Conference Board of Canada, Ottawa.

The Conference Board of Canada (1997). *Smoking And The Bottom Line: The Costs of Smoking in the Workplace.* Available from http://www.hc-sc.gc.ca/hppb/tobaccoreduction/workplace.html . Internet. Accessed 18 February, 2001.

The International Bank for Reconstruction (1999). *Curbing the Epidemic - Governments and the Economics of Tobacco Control*. The World Bank, Washington, D.C.

The Nova Scotia Lung Association (2001). *No Puffin' Places.* Available from http://www.ns.lung.ca/nopuffin/index.html . Internet. Accessed 15 February, 2001.

The Workers Compensation Board of British Columbia (2001). *The Economic Impacts of the Proposed Amendment to the ETS Regulation.* Pacific Analytics Inc., Victoria.

Tobacco BBS (1994). *NYC Smokefree Air Act Hearing, 9/26/94.* Available from http://www.tobacco.org/Misc/nyc_ciaa_9.26.94.html . Internet. Accessed 18 February, 2001.

Tobacco BBS (1998). *Judge Osteen's Ruling on the Tobacco Industry's EPA Lawsuit: Summary and Practical Implications.* Available from http://www.tobacco.org/Documents/osteensummary.html . Internet. Accessed 18 February, 2001.

Traynor, M. P., Begay, M.E., & Glantz, S.A. (1993). New Tobacco Industry Strategy to Prevent Local Tobacco Control. *Journal of the American Medical Association,* Vol. 270, No. 4.

Tyler, M.L. (1998). Blowing smoke: Do smokers have a right? Limiting the privacy rights of cigarette smokers. *Georgetown Law Journal,* Vol. 86, No. 3.

Warner, K.E. (1999). *The economics of tobacco: myths and realities.* Dept. of Health Management and Policy, School of Public Health, University of Michigan, Ann Arbor.

World Health Organization (1998). *Passive Smoking Does Cause Lung Cancer, Do Not Let Them Fool You.* Available from http://www.who.int/inf-pr-1998/en/pr98-29.html . Internet. Accessed 18 February, 2001.

World Health Organization (2000). *Economics of Tobacco Control.* Available from http://tobacco.who.int/en/economics/index.html . Internet. Accessed 18 February, 2001.